Journal

of the

Royal Naval Medical Service.

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Royal Naval Medical Service

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VOL. III

1917

JOHN BALE, SONS & DANIELSSON, LTD.

OXFORD HOUSE

83-91, GREAT TITCHFIELD STREET, OXFORD STREET, W. 1

Volume III January 1917 No 1

Journal of the Royal Naval Medical Service.

Original Articles.

CASES OF CEREBROSPINAL FEVER IN THE ROYAL NAVY—AUGUST 1 1915 TO JULY 31, 1916

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The following analysis of the cases of cerebrospinal fever in the Royal Navy during the second year of the war may serve as an addendum to the Report[1] on those occurring during the previous year Some of the etiological points dealt with at length in the previous Report such as overcrowding, the spread of the disease by carriers the influence of influenza and catarrhal affections and of meteorological conditions, and prophylaxis, have not been taken into consideration again The present Report contains —

(1) Remarks on the incidence of the cases
(2) Remarks on some clinical aspects
(3) A summary of the results of treatment
(4) A brief history of the outbreaks at various centres

(1) Incidence of the Cases

During the year August 1 1915, to July 31, 1916 there were 104 cases of cerebrospinal fever in the Royal Navy as compared with 170 cases during the first year of the war This fall in the

[1] This Journal 1915 vol i pp 373-407

number of cases must be correlated with the contemporaneous fall in the incidence of the disease both in the civil population and also in the Army in this country[1] Although the fall in the general incidence of the disease is probably the main factor in the smaller incidence in the Navy, it should be borne in mind that great care has been taken in prophylaxis and that in the first half of 1916 bacteriological examination of swabs from the throats of new entries was made at Haslar, Chatham Plymouth and at Greenwich of non-contacts (new entries and drafts for sea) in order to detect carriers* (*vide* pp 13 16 17) Out of 10,852 ratings examined 298 or 2 7 per cent, carriers were thus detected and isolated Not only has the incidence been smaller but it has been less widespread for no case occurred at Blandford Camp or in the Akbar Establishment in both of which there were a few cases during the first year of the war At the Deal Depot, which was responsible for twenty-five cases during the first year of the war there were two cases only in the second year No case of proved meningococcic meningitis has occurred during the last two years at Osborne or Dartmouth

The monthly incidence with the results is shewn below As in the first year of the War the largest number of cases and of deaths occurred in February

		Cases	Deaths	Recoveries
1915	August	4	2 or 50 0 per cent	2
	September	4	3 75 0	1
	October	3	1 33 3	3
	November	6	5 83 0	1
	December	8	4 50 0	4
1916	January	8	3 37 5	5
	February	26	7 26 9	19
	March	20	6 30 0	14
	April	7	1 28	6
	May	7	0 —	7
	June	3	2 66 7	1
	July	8	2 25 0	6
		104	37	67

Age Incidence—Among the 104 cases in the Navy 70 or 67 3 per cent, were under 20 years of age (83 or 79 8 per cent being under the age of 25 years) and the number of cases progressively diminished in the succeeding decades The percentage

[1] For this information I am indebted to Surgeon Colonel R J Reece H A C of the Local Government Board

of deaths was lower under 20 years than in any of the succeeding decades. The average age of the 101 cases was [illegible] years, of the fatal cases 22.2, and of the recoveries 19.4 years. The extremes of age were 15 and 46 years.

Age periods	Number of cases and percentage of the total 104 cases	[illegible]
15 to 19	70 or 67.3 per cent	[illegible]
20 " 29	21 " 20.1	[illegible]
30 " 39	6 " 5.8	[illegible]
40 " 49	4 " 3.8	[illegible]
	104	[illegible]

The case which recovered was [illegible] and third subdivisions [illegible] the coroner's inquest finding, presumably, as the cause of death.

In the first year of the war 60.6 per cent. of the cases were under 20 years of age.

Mortality.—Out of the 104 cases 37, or 35.6 per cent., proved fatal; this contrasts favourably with the mortality of 90, or 52.9 per cent., among the 170 cases during the first year of the war.

Ranks and Ratings.—There were two officers—a midshipman Royal Naval Reserve (aged 18) and a surgeon probationer (aged 21), who both recovered. The 102 ratings were as follows: Boys (seamen class), 39 (7 deaths); seamen, 22 (11 deaths); stokers, 13 (6 deaths); marines, 11 (3 deaths); engine-room artificers, 5 (2 deaths); officers' stewards, 3 (all fatal, average age, 20 years); carpenter's crew, 2 (1 death); boy servants, 2 (1 death); cook's mate, 1 (recovery); plumber's mate, 1 (recovery); armourer's crew, wireman, 1 (fatal); trimmer, 1 (recovery); boy artificer, 1 (fatal).

(2) Remarks on some Clinical Aspects.

Onset.—The mode of onset sometimes varied from the common form characterized by fever, malaise, headache and vomiting. Eight patients when first discovered were in an unconscious condition, and three of these had fallen out of their hammocks; one of these with a graze on the forehead, blood about the nostrils, and vomiting, was regarded for some days as a case of fractured base. Of the eight cases with this apoplectiform onset four proved fatal. In four cases in February respiratory symptoms were so well marked as to suggest pneumonia or acute bronchitis. In one case the prominence of abdominal symptoms gave rise to an initial diagnosis of appendicitis.

In eleven cases at least the disease began very shortly (within

three days) after [illegible] on leave (six cases), or returning from [illegible] (five cases) and in [illegible] instances considerable fatigue must [illegible] been entailed by the length of the journeys. In one instance the disease appeared three days after arriving on leave at Gosport from the Grand Fleet. In the five cases in which the disease appeared shortly after returning from leave, the question of infection when on leave arises. In thirteen cases the disease occurred within three weeks of joining the Service and exposure to the trials incident to this change of life. In three cases the disease followed the onset of measles after an interval of about ten days; as these cases were already under observation in hospital, it is improbable that the initial mottled rash of cerebrospinal fever was regarded as measles. In two other cases the disease attacked patients already in hospital for a lacerated finger and pleurisy respectively. In five cases (four fatal) meningitis in which the cerebrospinal fluid was proved bacteriologically to contain meningococci, supervened on otitis. In isolated instances drunkenness and head injury (one case), influenza and vaccination (four cases) immediately preceded the onset. In one case pneumonia and cerebrospinal fever co-existed.

These various factors may have so reduced the bodily resistance as to enable a saprophytic meningococcus in the nasopharynx to invade the system.

Rashes were recorded in 51 or 49 per cent. out of the 104 cases; in 11 cases the rash was petechial or haemorrhagic and in [illegible] or 36·6 per cent. of these proved fatal, a mortality percentage very little higher than that (34·6) of all the 104 cases. In one case with a petechial eruption haemorrhagic bullæ appeared on the ankles four days after the rash. In five cases there was a macular rash with one death, and in five cases a rose rash with one death. The mortality of the 51 cases with rashes was, therefore, 17 or 33·3 per cent., markedly slightly lower than the mortality of the total 104 cases. In the first year of the War rashes occurred in 102, or 62·6 per cent. of 163 cases, and the mortality of the cases with rashes was 52 (51 per cent.) or a little lower than that (52·9) of the total 170 cases. Although a very profuse haemorrhagic rash is extremely ominous, the occurrence of a rash is not necessarily of grave significance. The rash was nearly always noticed on the first or second day of the disease.

Herpes was noted in 21 or 20·2 per cent. of the 104 cases; in 20 cases the herpes was on the lips; in the remaining case it was in the distribution of the nasal branch of the ophthalmic division of the fifth nerve, but the cornea was not affected. In one of the cases with labial herpes there was also

[illegible] herpes In 11 [illegible] 2 cases the rash and the labial herpes both occurred on the second day of the disease, in the remaining cases the herpes appeared later than the rash on an average on the fourth day of the disease the extremes being the second and the eighth days In some instances the labial herpes was very profuse Of the 21 cases 4 or 19 per cent proved fatal this mortality is nearly half that (35 6 per cent) of the total 104 cases and thus agrees with the ancient belief that herpes in cerebro-spinal fever as in pneumonia is a good prognostic In the previous year herpes labialis was noted in 35 or 21 5 per cent of 163 cases—almost exactly the same proportion as in the present series

Rarer Manifestations and Complications—Ocular symptoms Photophobia which has been stated to be rare was noted in 10 cases conjunctivitis in 5, conjunctival hæmorrhage in 2 panophthalmitis with loss of an eye in 2 strabismus in 8 (5 fatal) ptosis in 3 (2 fatal) nystagmus on the second day in 1 (fatal) and von Graefe's sign in 1 Hemiplegia occurred in 1 case and weakness of the arm in another case, both of which were fatal facial paralysis in 1 (fatal), dysarthria in 1 (recovery), and dysphagia in 1 (recovery) Delirium tremens occurred in 2 cases (1 fatal) Pericarditis was noted in 2 cases both of which recovered Recent endocarditis was found after death in 1 case (*vide* p 12) and transient systolic murmurs were heard in 4 cases which recovered Status lymphaticus was found after death in 1 case Hæmaturia due to hæmorrhagic cystitis and pyelitis was seen in 1 case, and 1 patient had polyuria for a few days, passing 8, 6 and 4 pints of urine daily, while the temperature was about 103°F Epididymitis without any evidence of gonorrhœa occurred once.

Synovitis was noted in 1 cases (2 fatal) on the second, fifth and sixth days of the disease in 2 cases the knee was affected, in 1 the ankles and wrists, and in 1 the interphalangeal joint of a finger All the cases had a petechial or hæmorrhagic eruption this fits in with the view that when purpura and synovitis are associated, the latter is due to hæmorrhages into the synovial membrane In the case with arthritis of the wrists and ankles on the fifth day of the disease pericarditis with synovitis of the wrists ankles and knees developed on the ninth day in spite of delirium tremens recovery followed In the first year of the War there were 8 cases (2 fatal) of arthritis Acute otitis supervened in 2 cases, both of which recovered

[1] Foster and Gaskell Cerebrospinal Fever p 37 1916 Cambridge

Relapses during treatment are said not to be uncommon and generally to occur in cases of chronic hydrocephalus which terminate fatally. There was one case proved to be of this nature in a man aged 19, the relapse which started after nine days of convalescence being ushered in by a rigor. In one case a time relapse or brief second attack occurred seven weeks after the temperature had been normal and was followed by recovery (*vide* p. 11).

Mixed infections of the cerebrospinal fluid were reported in three cases: pneumococci in one case without any obvious focus, and streptococci in two cases (one an otitic case, in the other infection occurred through the lumbar puncture).

The manifestations of serum disease are dealt with on p. 10.

Diagnosis.—Only those cases in which meningococci were found in the cerebrospinal fluid have been accepted as cerebrospinal fever. In other words, lumbar puncture and examination of the cerebrospinal fluid have been regarded as necessary for diagnosis. This criterion has very probably led to the rejection of some genuine cases of cerebrospinal fever. But no clinical manifestation is pathognomonic of the disease. Thus a hæmorrhagic rash, though highly suggestive, was present in cases proved bacteriologically to be due to other infections such as pneumococci or to be free from micro-organisms. The latter group of cases, though unsatisfactory, must be recognized.[1]

A fulminating case of meningitis with a profuse hæmorrhagic rash occurred on November 7, 1915, in a cadet at Dartmouth. Bacteriological examination of the cerebrospinal fluid, which was almost clear and contained a few red blood cells and occasional polymorphonuclear leucocytes, by Fleet Surgeon H. W. Whitehouse, R.N., failed to show any micro-organisms; the cultures were sterile, and no carriers were detected among thirty contacts. There was no necropsy. A brother died in infancy from meningitis believed to be tuberculous.

Cases with meningeal symptoms, which showed meningococci in the nasopharynx but not in the cerebrospinal fluid, have been ruled out as they may have been meningococcic carriers with meningism due to some other cause. In this connexion it may be pointed out that during the acute stage of cerebrospinal fever swabs from the nasopharynx are often negative. Out of 13

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[1] Among 120 cerebrospinal fluids from cases of meningitis in the French Army, Sacquépée, Burnet and Weissenbach (*Bull. méd.*, 1915, xxix, 103–105) found six with the features of Widal's pluriform aseptic meningitis, in which no micro-organisms could be found by direct examination or culture.

[illegible] were found in the [illegible] This corresponds with von Lingelsheim's figures [illegible] cases of cerebrospinal fever with 146, or 22 per cent [illegible] from the nasopharynx[1]

Cerebral symptoms (meningism) accompanying [illegible] infections such as influenza pneumonia enteric otitis [illegible] closely imitate cerebrospinal fever and a certain diagnosis [illegible] made only by lumbar puncture and examination of the cerebrospinal fluid Even if a patient has signs of pneumonia [illegible] as shown by isolated cases in both the recent epidemics [illegible] Navy that there is meningococcic meningitis as well

From other forms of meningitis lumbar puncture and examination of the cerebrospinal fluid constitute again the most reliable method of diagnosis Even with pre existing otitis [illegible] not necessarily follow that meningococcic meningitis can be excluded for, as mentioned on p 4 in five cases (four fatal) meningitis in which the cerebrospinal fluid was proved bacteriologically to contain meningococci, supervened on otitis

Difficulty might arise in the diagnosis from the meningitic form of acute poliomyelitis in which all the symptoms of meningitis may be present but "on lumbar puncture the cerebrospinal fluid escapes under pressure is clear and on cytological examination may be found to contain an increased number of lymphocytes with a normal or sometimes a diminished sugar reaction and an increased amount of albumin" (Batten[2]) An outbreak in Devonshire and Cornwall in 1911 of what was at first thought to be cerebrospinal fever was shown by R J Reece[3] to be one of acute poliomyelitis and not one of acute poliomyelitis occurring concurrently with cerebrospinal fever In July 1916 there was at Shotley (vide p 18), an outbreak of fifteen cases with the clinical symptoms of cerebrospinal fever but four only were proved to be of this nature Among the remaining eleven cases there was one only which could be regarded as an example of the meningitic form of acute poliomyelitis

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[1] Quoted in the Report of the Special Advisory Committee upon Bacteriological Studies of Cerebrospinal Fever during the Epidemic of 1915 p 10

[2] Batten F E Acute Poliomyelitis p 68 1916. John Bale Sons and Danielsson London

[3] Reece, R J Report of the Medical Officer of the Local Government Board 1911 12 Appendix A No 4 p 51 1913.

In acute osteomyelitis of the spine lumbar puncture may give exit to pus from the extradural space This occurred in two cases in the Royal Navy which will subsequently be published In neither of those were there definite symptoms of cerebrospinal fever but Grisel[1] in a review of this form of osteomyelitis states that although in some cases the symptoms of compression are quite definite and disappear when the abscess is evacuated, there are others in which the association with meningitic symptoms and septicæmia renders the diagnosis very difficult

The sequence of events in the two following cases is, perhaps, worthy of brief mention

Two brothers from the Fair Isle Shetland, had measles in September, 1915 in Haslar One developed cerebrospinal fever thirteen days after the onset of measles and died The other who had never been well since the attack of measles died in Haslar three months later from tuberculous meningitis In both cases a post mortem examination was made

(3) Summary of the Results of Treatment

Two out of the 104 cases were discovered after death only and, therefore, were not treated for the disease 1 case (fatal) received serum only, and 6 cases of which 4, or 66 7 per cent, proved fatal had lumbar puncture only Therefore, out of 9 cases which did not receive serum 7 or 77 8 per cent proved fatal

Among the 95 cases treated by some form of serum the mortality was 30, or 31 6 per cent This result which is in striking contrast to the results of serum treatment in the first year of the War—105 cases with a mortality of 64, or 61 per cent—fully justifies the serum treatment of the disease, and is compatible with the widely expressed view that the serums employed in this country during the first year of the War were largely deficient in antibodies Flexner's serum made under his direction at the Rockefeller Institute, New York, was not available during the first year of the War, but after the failure in this country of anti meningococcic serum in the epidemic of 1915 the Rockefeller Institute reverted to the manufacture of the serum, and most generously placed a supply of a multivalent serum made from thirty two strains, at the disposal of the Royal Navy[2] Other serums employed during this year and not in the previous year, are Colonel Mervyn Gordon's

[1] Grisel P *Rev d'orthop*, Paris 1911 3 sér tome II p 145 For this reference I am indebted to Temporary Surgeon L Pearce Gould M D F R C S, R N

[2] *Vide* Amoss and Wollstein "A Method for the Rapid Preparation of Anti meningitis Serum" *Journ Exper Med* N Y, 1916 vol xxiii p 103

various serums and the Pasteur Institute's multivalent serum. In the early part of the second year of the War, when the new serums were not available, Mulford's serum was given in a number of the cases, and throughout the year use was also made of the Lister Institute serum and of Burroughs Wellcome and Co.'s serum.

Of the 95 treated with intrathecal injections of serum, 60 did not receive any other form of specific treatment and had a mortality of 18, or 30 per cent., which is a little lower than that (31·6) of the 95 cases. The remaining 35 cases received in addition one or more of the following forms of treatment: hypodermic or intramuscular injection of the serum, of vaccines or of soamin, or hexamine by the mouth, with a mortality of 12 or 34·3 per cent. In 23 out of the 35 cases the additional treatment was the simultaneous subcutaneous (or in a few instances intramuscular) injection of serum; this method was mainly adopted at Plymouth and Haslar: the mortality was 7, or 30·4 per cent. Vaccines were given in 8 cases but did not appear, except perhaps in one or two instances, to exert any decided beneficial effect. The exact figures of the results of treatment are shown in the tabular form below.—

TABULAR SUMMARY OF TREATMENT.

	Cases	Deaths		Recoveries	
Intrameningococcic Serum—					
Intrathecally	95	30 or 31·6 per cent		65 or 68·4 per cent.	
Alone	60	18	30	42	70
Combined with serum hypodermically, vaccines, soamin or hexamine	35	12	34·3	23	65·7
Combined with serum hypodermically	23	7	30·4 ,,	16	69·6
Combined with vaccine	4	1	25	1	25
Combined with vaccine, soamin and hexamine	1	—		1	
Combined with vaccine and hexamine	1	1		—	
Combined with soamin	2	1		1	
Combined with hexamine	2			2	
Vaccines—					
(Never alone, always with intrathecal injection of serum) as above	8	4		1	
Hexamine—					
Alone	1	1		—	
Combined with intrathecal injections of serum &c. as above	6	1		5	
Soamin—					
Alone	1	1		—	
Combined with intrathecal injections of serum &c. as above	3	1		2	
Lumbar puncture (only)	3	4 or 66·7 per cent		2 or 33·3 per cent	
Symptomatic Treatment (only)	2	2			

Many [illegible] quarters of the 95 cases received treatment within [illegible] of the 6th case. From tabulation of 1 941 cases [illegible] that when the serum was given within the first [illegible] the mortality rate was 18 per cent; when between the [illegible] seventh days 27 4 per cent, and when later than the [illegible] day 6 5 per cent; and therefore laid stress on the importance of early injection. In the 95 cases treated with serum in the Royal Navy this influence of time can also be seen:—

	Cases	Deaths	Per cent.		Per cent.
[illegible] day	34	3 or 99 7 per cent		59 or 70	per cent
[illegible] day	1	5	33 3	16	66 1
[illegible] than the 7th	6	9	50	3	all
	95	26	31 1	65	68 1

The results obtained by the use of the various brands of serum are [illegible] in a tabular statement. Flexner's serum was employed in 49 cases altogether with a mortality of 9 or 23 per cent; [illegible] the 39 cases it was the only serum used with a mortality of 6 or 23 per cent; the 12 other cases in which other serums were given as well showed a mortality of 3 or 25 per cent. The [illegible] were given in much fewer cases. The mortality [illegible] the 11 cases that received Burroughs Wellcome and [illegible] combined with other serums was slightly [illegible] the cases treated with Flexner's serum, and the [illegible] Gordon's various serums alone showed an even [illegible]

The [illegible] of injections on which serum was given varied [illegible] the 95 cases from one to eight according to the duration of the symptoms. In some instances the improvement and fall of temperature after the injection of serum were dramatic.

Sixteen cases received one dose only, and 7 proved fatal, 6 being very acute or fulminant cases. 35 received two doses of serum (8 deaths), 22 cases three doses (7 deaths), 8 cases four doses (1 death), 11 cases five doses (1 death), 4 cases six doses (2 deaths), 4 cases seven doses (1 death), and 1 case eight doses (no death). In many cases lumbar puncture was performed more often than serum was injected. In 1 chronic case in which serum was given six times, lumbar puncture was performed on 30 occasions.

Serum rashes.—Urticarial or urticarial were mentioned in 22 or 23 per cent. of the 95 cases treated by serum, but may have been more frequent. The rashes and articular manifestations were practically confined to cases treated with Flexner's and Burroughs, Wellcome and Co's brands.

Out of the 22 cases 21 received either Flexner's or Burroughs Wellcome and Co's serum. 12 had Flexner's serum alone, 2 Flexner's and

G[illegible] serums 1 Flexner's and the Pasteur Institute [illegible] serums 2 Burroughs, Wellcome and Co's serum alone 1 Burroughs Wellcome and Co's and Gordon's serums and 3 Flexner's and Burroughs Wellcome and Co's serums (only 1 cases had this combination) The remaining case had 70 c c of Gordon's serum and did not have any manifestations of serum disease except the rash Out of the 9[illegible] cases treated with serum, 41 had Flexner's or Burroughs Wellcome and Co's serum and among them rashes occurred in 21 or 51 per cent whereas among the remaining 51 cases treated by serum there was a rash in one case only Six of the 22 cases with rashes also had serum hypodermically The average amount of serum received by the cases with rashes was 60 c c and the average amount received by 14 other cases which had Flexner's or Burroughs Wellcome and Co's serum and recovered was 70 c c, or practically the same

TABLE SHOWING RESULTS OF TREATMENT BY DIFFERENT SERUMS

	Cases	Rash	Recovery
Flexner's serum alone	27	6 or 22 2 per cent	21 or 77 7 per cent
Combined with other serums	14	1 or 7	1 or 5
	41	9 or 22 per cent	22 or 17 per cent
Gordon's serums alone	16	3 or 18 7 per cent	13 or 81 3 per cent
Combined with other serums	6	3 or 50	3 or 50
	22	6 or 27 3 per cent	16 or 72 7 per cent
Pasteur Institute exact values serum (36 F) alone	9	4 or 44 per cent	5 or 55 5 per cent
Combined with other serums	5	1 or 20	4 or 80
	14	5 or 35 7 per cent	9 or 64 3 per cent
Burroughs Wellcome and Co serum alone	7	1 or 14 3 per cent	6 or 85 7 per cent
Combined with other serum	8	1 or 12 5	7 or 87 5
	15	2 or 13 3 per cent	13 or 86 7 per cent
Mixed serums alone	10	1 or 10 per cent	9 or 90 per cent
Combined with other serum	2	1	1
	12	2	
Haslar [illegible] alone	11	1 or 91 5 per cent	[illegible] per cent

On an average the rash appeared ten days after the first injection of serum In a case at Haslar which received one injection of 20 c c of Flexner's serum in a relapse seven weeks after the primary attack in Egypt there was within a few hours an immediate serum rash The patient stated that nine lumbar punctures had been performed in the primary attack, but there is no official information as to the administration of serum

Of the 22 cases none proved fatal, but as the serum rash occurs after an interval of about ten days, the fulminating and acute cases are obviously excluded, and this observation has no

prognostic value Six cases had both herpes and a serum rash nine cases an initial rash and a serum rash and three cases an initial rash herpes and a serum rash (in one case on two occasions) presumably in these instances the skin was especially prone to react

In some cases pains in the joints without effusion accompanied the serum rash, and in two instances effusion into the joints and a temperature of 102° F coincided with the rash In two cases at Chatham temporary deafness occurred at the same time as a serum rash and arthralgia, and was regarded by Temporary Surgeon A C MacAllister as a manifestation of serum disease

Grave accidents due to intrathecal injection of antimeningococcic serum were very rare

In one case lumbar puncture was done directly after admission to the Royal Naval Hospital Plymouth and 50 c c of turbid fluid containing meningococci spurted out 15 c c of Gordon's multivalent serum was given intrathecally and the same quantity hypodermically Respiration stopped at once The necropsy showed fibrinous adhesions and purulent streaks over the cerebral sulci, with but little exudation at the base of the brain Both lateral ventricles were distended with blood stained serum The purulent exudate over the hemispheres suggested that the illness had lasted a week In another case at Plymouth lumbar puncture on the third day of the disease gave exit to 30 c c of turbid fluid and 15 c c of Gordon's multivalent serum were injected intrathecally, five hours later respiration stopped before the pulse The necropsy showed fibrino purulent exudate over the base of the brain and much yellowish fibrin over the pons and medulla turbid and blood stained fluid in both ventricles edema of the cerebellum pressing on the pons dilatation of the right side of the heart and recent and old endocarditis of the mitral valve Although death did not occur until five hours after the injection of serum this case resembles the first in the pressure of blood stained fluid in the lateral ventricles of the brain In a third case death occurred suddenly seven hours after injection of serum and the necropsy showed distension of the lateral ventricles and acute congestion and edema of the cerebellum pressing on the pons

In a man who had had six lumbar punctures the site of the punctures became inflamed and death rapidly followed, at the necropsy it was found that the lateral ventricles were greatly distended with pus swarming with streptococci

In two cases lumbar puncture gave rise repeatedly to severe headache which was partially relieved when serum was rejected intrathecally

(4) History of the Outbreaks of Cerebrospinal Fever at Various Centres

The Portsmouth District

The 28 cases treated at the Royal Naval Hospital Haslar, were drawn from the Royal Naval Barracks Portsmouth (14 cases) the Royal Marine Artillery Barracks Eastney (4 cases) the Royal Marine

Light Infantry Barracks, Forton (3 cases), H M S Excellent (9 cases) H M S Fisgard (2 cases) and isolated cases from H M S "Amphitrite, H M S "Vernon" and from a torpedo boat Three of the 28 cases arose in the Zymotic Block at Haslar while under treatment for measles

In the Portsmouth district the monthly incidence of cases in the Royal Navy was as follows August 3 September 3 October 2 January, 3, February 5 March 9 April 2 and May 1 As in the first year of the War the largest number of cases occurred in March

The early cases were treated by Mullord's serum (5 recoveries 4 deaths) then 6 cases were given the Pasteur Institute multivalent serum or Gordon's serum (4 recoveries 2 deaths) and in the later part of the year Flexner's serum alone was given (with 9 recoveries 1 death) Three cases were not given serum (2 recovering 1 death) Staff Surgeon Adshead found that lumbar punctures could be performed without discomfort or struggling under the influence of a hypodermic injection of scopolamine $\frac{1}{100}$ gr morphine $\frac{1}{4}$ gr and atropine $\frac{1}{150}$ gr in 5 minims of water given half an hour previously

Of the 28 cases 8 or 28 5 per cent died and 20 recovered this compares favourably with a mortality of 19, or 52 7 per cent out of the 36 cases treated at Haslar in the previous year

Dr P Fildes found that out of 603 contacts there were 25 or 4 1 per cent carriers that out of 2 023 new entries swabbed there were no positive carriers and that swabs from 16 cases of the disease were in every instance negative

The Royal Naval Barracks, Portsmouth—Out of the 14 cases four occurred between August 28 and September 8 1915 On August 28 29 31 cases occurred in three boys who were in contact with a boy who had the disease in April 1915 and was found in September to be an obstinate carrier An isolated case occurred on September 8, and then there were no cases until February 10, 11, 16 and 24 On March 4 a case arose in Haslar Camp in a man who left the barracks on February 28 other cases occurred on March 4 6, 13 14 and 27 and the last case occurred on April 23 The total number of cases is practically the same as in the previous year (16)

The Royal Marine Artillery Barracks Eastney—The first of the four cases (one fatal) from this depot occurred on February 16 and was so atypical that it was not until March 7 that lumbar puncture was performed and proved that the cerebrospinal fluid which was clear contained meningococci It is perhaps worthy of note that about the same date a similarly atypical case which was not bacteriologically proved until three weeks after admission arose in the Royal Naval Barracks, Portsmouth and that both cases recovered without the use of serum A fulminating case, fatal within thirty six hours occurred on March 8 followed by unconnected and non fatal cases on March 10 and 26 In the first year of the War there were 12 cases with 6 deaths

The Royal Marine Light Infantry Barracks Forton—Of the three cases borne on the books of these barracks one only arose in the barracks A boy aged 17 went sick on May 5 in a room with an individual space of 600 cubic feet the origin of the infection could not be traced Of the other two cases one was remarkable as presenting a relapse after a long interval a private went sick with the disease on

January 13, at Alexandria where he was proved bacteriologically to have the disease and according to his own statement was tapped nine times After February 1 the temperature was normal, and on March 20 he was admitted convalescent to Haslar On March 23 the temperature rose to 101 1° F He had a violent headache Kernig's sign, and lumbar puncture yielded 30 c.c. of turbid fluid under great pressure containing meningococci He received 20 c.c. of Flexner's (1915) serum and within a few hours had an immediate serum rash The temperature was normal on March 24 and he made a good recovery The other case was in a private who left his ship for his home in Gosport five days before he went sick he never went into Forton Barracks and he might have contracted the disease on the journey from the Grand Fleet

During the previous year four cases, none of which originated in the Barracks were reported from this depot

The Plymouth District

Twenty eight cases were reported from the depot as compared with 48 in the first year of the War Twenty seven were treated in the Royal Naval Hospital, Plymouth the remaining case was in a man who joined the Royal Naval Barracks on March 2 1916 went on leave two days later died on March 7 in London and was found at the necropsy to have cerebrospinal fever The 28 cases were drawn from the Impregnable Establishment (13 cases) the 'Powerful' Establishment (7 cases) the Royal Naval Barracks (4 cases), H M S "Cambrian" (2 cases) and H M S "Indus" (2 cases)

In the Plymouth district the monthly incidence of cerebrospinal fever in the Royal Navy was November 2 December, 4 January 2 February 10 March 4 June 1 and July 1 As in the first year of the War the largest number of cases occurred in February

In the majority of the cases lumbar puncture was performed under general anæsthetic by Staff Surgeon D H C Given The first 7 cases, in November 12 1915, to January 10 1916 were treated with the Pasteur Institute serum (3 deaths) after this Pasteur Institute multivalent serum Gordon's multivalent serum or Flexner's multivalent serum were used sometimes alone, sometimes in combination Out of 5 cases treated solely with Flexner's serum 1 only proved fatal and in this instance there was a secondary streptococcic infection of the nervous system through the lumbar puncture wound Of 6 cases treated with the Pasteur Institute's multivalent serum 1 only died of 4 cases treated with Gordon's multivalent serum 1 proved fatal of 3 cases treated with both Flexner's and the Pasteur Institute's serums 1 died, and of 2 treated with Flexner and Gordon's serums 1 died Of these 27 cases 19, or 70 per cent. recovered and 8, or 30 per cent, proved fatal This is better than the 36 7 per cent mortality in the previous year which was remarkably low for that epidemic The mortality appeared to be determined by the age of the patients rather than by their treatment for out of 20 boys from the 'Impregnable' (13) and 'Powerful' (7) Establishments none of whom were more than 16 years of age 2 or 10 per cent only died whereas out of 7 men from the Royal Naval Barracks H M S "Cambrian" and "Indus" 6 or 85 7 per cent, died, the man who recovered was 36 years of age.

Fleet Surgeon H C Whiteside found that out of 2 049 contacts of

cerebrospinal fever cases 195 or 9·5 per cent. [illegible] out of 2,813 new entries 52 or 1·84 per cent. [illegible] This investigation referring to the first half of 1916 [illegible] ject of a report by Fleet Surgeon H. C. Whiteside.

In *the Impregnable Establishment* the first [illegible] on November 12 in Impregnable I and proved [illegible] Cases then occurred in "Impregnable III on November 2 [illegible] 2 (fatal) 4 and 8, the last two being from the same mess. On December 14 a case occurred in Impregnable IV (late "Curaçao") by whom had communication with Impregnable III. After an interval of seven weeks 3 cases occurred in Impregnable I on February 1 and 12 (a case). On February 23 a case appeared in [illegible] ship III. After this isolated cases arose in Impregnable III on April 21 and in Impregnable I on June 8 and July 23. The last case was of rather special interest as the cerebrospinal fluid contained pneumococci as well as meningococci. There was a hemorrhagic rash, herpes of the nasal branch of the ophthalmic division of the fifth nerve no evidence of pneumonia and recovery. The number of cases (16) is larger than during the first year of the War (9) although, from figures kindly provided by Fleet Surgeon L. E. Dartnell the individual cubic space is now greater than it was a year ago.

The "Powerful" Establishment which had 2 cases in 1914 and 2 cases in the first year of the War both on April 10 1915 in "Powerful I" had 7 cases between February 1 and April 29 1916. Six cases occurred in "Powerful I" on February 1 18 19, March 29 April 2 and 29. One case arose in "Powerful II" on February 4. The increased incidence of cerebrospinal fever in "Powerful I" is due to some undetected factor, for the hygienic conditions have improved since the first year of the War: the upper parts of the doors in the casemates which are used for classes have been perforated, thereby increasing the ventilation. The upper deck was roofed over and boys slept there since January 21 1916 in this way 100 additional cubic feet per boy was obtained, and the incidence of catarrhal fevers forthwith diminished. Nevertheless cerebrospinal fever began on February 1.

The Royal Naval Barracks, Devonport.—A fulminating case occurred on March 29, 1915 followed on March 30 by a case which recovered and on April 2 by a case which proved fatal with a secondary streptococcic infection from the lumbar puncture (*vide* p. 12). None of these cases had been in contact with cerebrospinal fever patients or with previously recognized carriers. As mentioned above a man attached to this depot died in London of cerebrospinal fever but was in the barracks for two days only. In the first year of the War there were fifteen cases in this depot.

In the "Cambrian" two cases occurred among the stokers on January 10 (a fulminating case) and 30. No cases occurred here during the first year of the War.

In the "Indus" two cases occurred among the engine room artificers on February 7 and 29. During the first year of the War there were two cases here.

At the Marine Light Infantry Barracks, Devonport no cases occurred. In the first year of the War there were three cases.

Chatham District

The 18 cases reported were drawn from the Royal Naval Barracks (14) the Royal Marine Light Infantry Barracks (2) and H M S Egmont (2) and were treated at the Royal Naval Hospital, Chatham

The monthly incidence of cases in the Royal Navy in the Chatham District was as follows November, 1 December, 3 February 6 March 6 April, 1 May 1 In the previous year the largest number of cases occurred in February During March 1916, there was an outbreak of the disease among the soldiers in the district

The treatment of the cases was described by Temporary Surgeon W H W Cheyne who insisted on the importance of early and frequent injection of mixed serums and of anæsthesia for lumbar puncture and the administration of serum

Of the 18 cases 9 or 50 per cent, proved fatal this is an improvement on the mortality of 16, or 76 per cent out of the 21 cases during the first year of the War but it is much above the percentage mortality (35 6) for the whole 104 cases in the Royal Navy during the second year of the War In this connection the following points should be taken into consideration Two of the fatal cases were complicated with otitis (1 with a large perforation of the tegmentum tympani into the cranial cavity, the other with thrombosis of the cavernous sinus), which appeared to be the lethal lesion and 3 other fatal cases had one dose only of the Lister Institute serum Of the remaining 13 cases treated with serums 4 (1 with delirium tremens) or 31 per cent proved fatal Of the 9 recoveries, 4 were crippled (2 having lost an eye)

Staff Surgeon S T Dudley found that out of 2 548 new entries (March to July, 1916, inclusive) swabbed 58 or 2 23 per cent., were positive carriers

Royal Naval Barracks—The first case occurred on November 28 in a boy servant who had already been fourteen days in a medical ward of the Royal Naval Hospital for right sided pleurisy The second case, in a second class stoker returned from leave with symptoms of two days duration on December 4 The third case in a seaman aged 37 one of otitis with thrombosis of the cavernous sinus went sick on December 5, and was bacteriologically proved to be meningococcic at the necropsy only No further case occurred until February 6 when a seaman aged 28 had a sharp attack of the disease from which he recovered It is interesting to note that in July 1915 he had high fever and meningitic symptoms in the Royal Naval Hospital Plymouth, where lumbar puncture was done and normal cerebrospinal fluid withdrawn He had a strongly positive Wassermann reaction and recovered under anti syphilitic treatment On February 17 an officer s steward third class who had been in the service nineteen days went sick On February 22 a second class stoker developed the disease and on February 23 a cook s mate went sick A close contact of the case on February 22 showed signs of the disease on February 27 Then there was an interval until March 13, when 3 cases occurred among second class stokers followed on March 23 by a seaman R N R On March 30 another second class stoker went sick with the symptoms of the disease and died when on leave but as bacteriological examination was not available, he is not included as a case A fulminating case in an officer s steward third class occurred on

[illegible] cases [illegible] ...

[illegible] *hog* [illegible] *Eagle* [illegible] on December [illegible]

[illegible]

At this depot between [illegible] cases with a mortality [illegible] deaths (6·6 per [illegible] War [illegible] the incidence at the [illegible] the [illegible] again [illegible] Cerebrospinal Fever [illegible] [illegible] information [illegible]

The [illegible] commenced on December [illegible] and [illegible] prevalent [illegible] fever [illegible] cases occurred [illegible] there were [illegible] 2nd 9th [illegible] June [illegible] July [illegible] These cases [illegible] Cerebrospinal [illegible] sick [illegible] hexamine [illegible]

Fleet Surgeon P. W. Bassett Smith [illegible] 3 or 6·12 per cent positive carriers [illegible] entries and deaths [illegible] completed their training examination [illegible] 46, 45 carriers, 37 of which [illegible]

Sick Berth Establishment.

There were [illegible] cases with 4 deaths [illegible] between November 16 [illegible] and July 29 [illegible] with 7 cases (5 fatal) in the history of the War. [illegible] on probation [illegible] (from H.M.S. Lydmilla) was tested in [illegible] recovered.

The first case occurred on November 16 [illegible] in hospital with [illegible] and [illegible] for twelve days and was considered when symptoms [illegible] nose and lumbar puncture showed that meningococci [illegible] On November 19 there was a second case [illegible] occurred until February 8, 1916 when a boy in the [illegible] which of cerebrospinal fever. Seven weeks later [illegible] case in a boy who rapidly recovered. [illegible] Cases also occurred on May 8, 23, and [illegible] interval there was a sudden outbreak [illegible] of cerebrospinal fever in July. Of [illegible] cases [illegible] to be due to meningococcic infection. [illegible] occurred on July 10 in a boy who had been in the Sick [illegible] had been vaccinated six days before the onset of [illegible] A [illegible] proved case of cerebrospinal fever occurred [illegible] the [illegible] dormitory (No. 7) which had an individual enclosure [illegible] had joined two and a half weeks previously [illegible] a week before the onset. Two other cases [illegible] positive occurred in the same dormitory on July 30 [illegible] A third case of cerebrospinal fever arose on July 31 in a [illegible] this boy had

joined the Service the day be[illegible] vaccinated A fourth case occurred on July 29

Of the 11 cases not proved bacteriologically to be meningococcic the records of the cytological examination of the cerebrospinal fluid are available in 6 cases in 2 there was an excess of lymphocytes over polymorphonuclears neither of these cases showed any subsequent paralysis, and so cannot be regarded as examples of the meningitic form of acute poliomyelitis further as there was one case only of mumps during July at Shotley, it is improbable that the meningitis was a complication of that disease In 1 case the lymphocytes and polymorphonuclears in the cerebrospinal fluid were present in about equal numbers In 2 cases the polymorphonuclears were in excess of the lymphocytes in one of these cases there was transient and slight weakness of one leg Four other cases had persistent headache 2 showing mental disablement One case the cytological report of the cerebrospinal fluid of which is not known was left with weakness of the right leg, loss of the knee jerk on that side, tenderness of the posterior tibial nerve, and weakness of control of the bladder This appears to be the only one of the 11 cases which could be regarded as an example of the meningitic form of acute poliomyelitis Dr G I P Stewart Medical Officer of Health for East Suffolk has kindly informed me that no contemporaneous outbreak of acute poliomyelitis or of cases of a similar doubtful nature was reported in the county

Ten cases were treated by intrathecal injection of Gordon's multivalent serum after washing out the spinal cord with 0 5 per cent of carbolic acid in saline solution as suggested by Captain Sheffield Neave R A M C (T) of Ipswich This method of treatment appeared to be beneficial and certainly no bad effects were ascribed to it

Deal

At the Marine Depot 3 cases occurred on January 31 and February 1 both of which recovered In the first year of the War 25 cases (with 8 deaths) originated at this depot

Cases in Sea going Ships

Ten cases were reported from sea going ships but in no instance did more than 1 case arise in the same vessel a most satisfactory result The cases occurred in the "Campania (August 6 1915), "Torpedo Boat No 110 (September 9) a mine sweeper St Elvies' (September 28), 'Shannon (October 13), 'Dolence (November 5) Bristol (May 3 1916), "Conqueror (May 5) 'Royal Oak (May 23), Lydiard (July 9) and 'Malaya (July 27) There were 5 deaths The average age of all the cases was 23 7 years of the fatal cases 25 2 and of the recoveries 22 2 years The high mortality is perhaps explained by the delay that may necessarily occur in obtaining serum treatment In the first year of the War there were 12 cases with 8 deaths in only one ship was there more than one case. Thus during the first two years of the War out of 274 cases of cerebrospinal fever 23, or 8 per cent cases with 13 deaths or a percentage of 59, occurred in sea going ships

In addition to the medical officers incidentally mentioned I beg to express my sincere thanks for courteous help and information to Deputy Surgeons General H W G, Doyne and R. Bill, C V O Fleet Surgeons W H S Stalkartt F Fedarb M Rodd T D Halahan, J A Campbell C J E Cock W L Martin E A Shaw Staff Surgeon L Warren, and Temporary Surgeons W H Watson Cheyne, and E J Tongue.

THE EFFECT OF [illegible] ON THE AGGLUTINATION REACTIONS FOR TYPHOID FEVER AND THE DIAGNOSIS OF TYPHOID IN CASES IN INOCULATED PERSONS

By [illegible] Surgeon [illegible] R.N.
R.N. Hospital [illegible]

The following communication deals with the results of agglutination tests performed at the Royal Naval Hospital, Haslar, on about 1,000 inoculated men from the Gallipoli region.

The men had all been invalided home having suffered or, in some cases still suffering from either typhoid, paratyphoid or dysentery or, as was often the case, from intestinal symptoms which could not be attributed to any of these diseases, and were therefore distinguished by the non committal term "enteritis."

The patients were for the most part, convalescent on arrival. They were all, however, subjected to a routine bacteriological examination, one of the chief objects of which was to estimate the incidence of typhoid fever amongst those invalided home and form some opinion upon the value of antityphoid inoculation.

Part of the examination therefore consisted in testing the agglutination reactions of the patients' serum on the organisms of the typhoid and dysentery groups.

These reactions were in the majority of cases the only grounds on which to base a diagnosis and, when typhoid was in question, this diagnosis was complicated by the fact that over 90 per cent. of the men had received antityphoid inoculations.

Owing to the pressure of work, and to the fact that the patients' stay in hospital was usually a short one, it was impossible in most cases to test the blood on more than one occasion. No conclusions based upon variations in the titre of the serum were therefore possible.

When the results of somewhat over a thousand Widal reactions were available, it was decided to try to estimate the significance of the various degrees of agglutinating power met with in the inoculated individuals. The series under analysis then, consisted of inoculated men, some giving a negative Widal reaction and others giving various degrees of positive reaction, the effect either of the inoculation or of typhoid infection or possibly in a few cases the result of both these factors.

At first sight it [illegible] impossible to draw any conclusions from a [illegible] in which in some of the cases the reactions were [illegible] after inoculation while in others, they were produced by [illegible] fever. As will be shown later, however, advantage [illegible] that the strength of the reaction, in those showing [illegible] its only will decrease as the time since inoculation [illegible] This relation to the time of inoculation will not [illegible] in which the reaction is due to subsequent typhoid [illegible]

Technique

The majority of the [illegible] were performed by the same observer, Lieut. Surgeon [illegible] Shaw. The standard emulsions of Dreyer were used exclusively [illegible] *Bacillus typhosus*. Using of almost uniform agglutinating [illegible] the series. The macroscopic method in small test tubes [illegible] to 55° C. for two hours was adopted. The serum [illegible] being tested in dilutions of 1 in 25, 1 in 50, 1 in 100, and 1 in 200.

Distribution of Reactions to Agglutination Tests

By dividing the [illegible] groups according to these various strengths of reaction it was possible to say that certain groups were composed chiefly of individuals exhibiting inoculation effects only, while in the other group the agglutination reactions were in the majority of cases due to typhoid infection.

The date of the [illegible] being recorded in each case the next step was to arrange the results in a table as follows: —

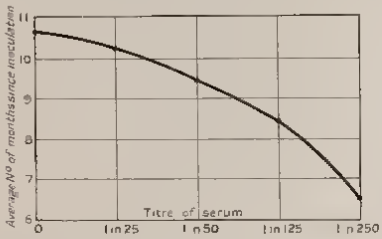
[illegible] Cases which gave Agglutination Reactions in [illegible] at [illegible] Months after Inoculation

Type	Number of Reactions in Months																							
	[illegible]																							
	[illegible]																							

The cases [illegible] in hospital [illegible] groups. (1) Those giving no agglutination [illegible] of 1 in 25. (2) positive in 1 in 25. (3)

positive in 1 in 50 (4) positive in 1 in 125, (5) positive in 1 in 250 and over This table supplies the data from which subsequent deductions are made

If a number of persons have been inoculated against typhoid and have not subsequently contracted the disease those recently inoculated will show, on the average, a greater degree of agglutinating power than those inoculated at a more distant date Conversely the cases being arranged in groups according to the titre of the serum the average time since inoculation for each group will diminish as the titre increases e g, those giving a reaction in 1 in 250 will show on the average a shorter post-inoculation time than those which give a positive only in 1 in 125 This may be represented graphically thus —



The first step in this investigation therefore was to find the average time since inoculation for each group of the series (grouped according to strength of titre) and observe to what extent the results agreed with the above

The average time for each group was obtained from the original table thus Multiply the number under each month by the number of the month add the series of numbers so obtained for each group together and divide this total by the total number of cases in the group The average time since inoculation for the whole series was estimated in a similar manner

The following results were obtained —

Titre of serum	Average number of months since inoculation
Negative	8·96
Positive 1 in 25	8·66
1 in 50	8·32
1 in 125	[illegible]
1 in 250	9·[illegible]
Average time for whole series	8·6[illegible]

These results are expressed graphically thus (Chart A) —

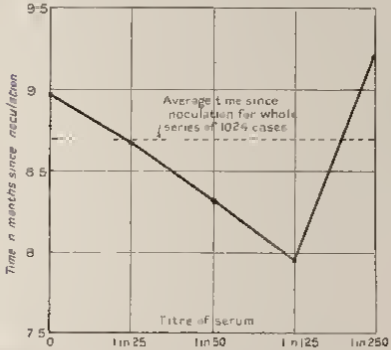


Chart A showing average number of months since inoculation for each group of serum. Groups (1) Negative (2) Positive 1 in 25 (3) 1 in 50 (4) 1 in 125 (5) 1 in 250

It will be seen from this chart that the first four groups i.e. Negative, 1 in 25, 1 in 50 and 1 in 125 correspond with the previous chart in showing a steadily diminishing post-inoculation period as the titres become higher. The last group 1 in 250 on the other hand, shows a striking deviation from this downward line giving an average post-inoculation time greater than that exhibited by the negative group. Obviously, therefore the cases in this 1 in 250 group have been influenced by some other factor than inoculation

[illegible] To [illegible] were [illegible] tested and [illegible] charted [illegible] above. The numbers being small they [illegible] group. (1) Negatives (2) positives in [illegible] from 1 in [illegible] 1 in 125 (3) positives in 1 in 250 or [illegible] These are charted with the previous series, which is also [illegible] three similar groups.

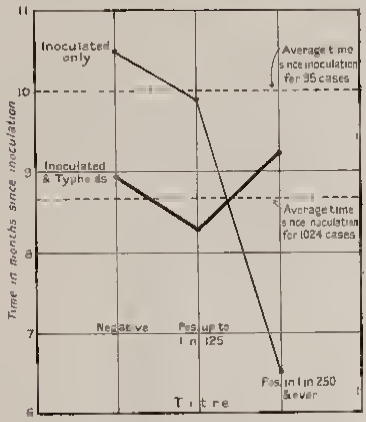


CHART B.—Comparing two series. (1) Mixed series in some of which the reactions are due to typhoid. (2) those in which the reactions are due to inoculation alone.

It will be observed that the first parts of both curves are similar the negative groups showing a post-inoculation time above the average, while in the second groups comprising those positive in dilutions of 1 in 125 and less it is below the average—the average

time [illegible] in each case indicated on the chart by [illegible]

[illegible] of 1,024 cases therefore, the [illegible] positive in 1 in 12 or less agrees with [illegible] we would expect of a collection of cases showing reactions due to inoculation They also behave in the same way as a series which we know is made up of those exhibiting inoculation effects only We can, therefore say that these groups giving positives in dilutions of 1 in 12 or less contain very few cases of typhoid the reaction being almost entirely due to antityphoid inoculation

When we come to the last group in the two series under consideration which comprises those positive in 1 in 250 and over the control cases show a post-inoculation time considerably below that of the previous groups while our original series shows a time well above the average and indeed above that of the negative group We may therefore safely say that this group giving a positive in 1 in 250 or more is composed mainly of those in whom the agglutination reaction is the result of typhoid infection the longer post inoculation period indicating that this infection occurred chiefly in those cases in which the protective effect of the typhoid vaccine was wearing off with the lapse of time

It has now been shown that inoculation is responsible for the vast majority of positive reactions in dilutions of 1 in 125 or less, while positives in dilution of 1 in 250 or more are as a rule the result of typhoid infection

We shall now consider in more detail the various groups of cases giving different degrees of reaction

The arrangement of results for this purpose is different from that just used the data, however are obtained as before from the table given in the beginning of the article. The cases are divided into three classes according to the time since inoculation (1) Those inoculated within six months of examination, (2) between six and twelve months (3) between twelve and eighteen months In each of these periods of six months the number of cases showing the various strengths of titre is recorded and these numbers are expressed as percentages

The figures thus given represent the percentage of cases for each titre in each of these three periods of six months If these are expressed graphically we get the following chart The manner in which the percentage of cases giving any one titre varies, according to the time since inoculation, can be seen in this chart at a glance

[illegible] INTO THE [illegible] OF THE NUMBER OF [illegible] VARIOUS DILUTIONS OF VACCINATION

[illegible]	[illegible]	[illegible]	Months since inoculation				
			Number	Per cent	Number	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	1 1	10	35 1	1	[illegible]
[illegible]	[illegible]	[illegible]	1	2	15 1	93	[illegible]
[illegible]	[illegible]	[illegible]	8	11	14 5	40	[illegible]
[illegible]	[illegible]	[illegible]	1	4	17 8	1[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	1	[illegible]	11 7	3	[illegible]
[illegible]	[illegible]	[illegible]	1[illegible] 0	16 1	100 0	1[illegible]	[illegible]

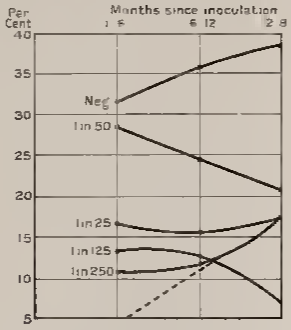


Fig. 1. Showing the various percentages giving different titres after each of the six monthly periods since inoculation.

Taking the groups in order therefore —

(1) *Negatives.*—The percentage of inoculated individuals giving a negative result in 1 in 25 dilution within six months of inoculation is fairly high being 31·5 per cent. The percentage of these

negative cases increases steadily as the "post inoculation" time becomes longer, reaching 38·5 per cent for the cases inoculated twelve to eighteen months previously. The comparatively small difference in the number of negatives yielded by those examined within six months of inoculation, and those twelve months or more after probably depends on two factors —

(*a*) Most of the cases which give a negative in 1 in 25 fall to this level early in the first six months. This is to be expected from the usual form of the agglutination curve showing an early steep descent which in these cases brings the titre to below 1 in 25. Thus —

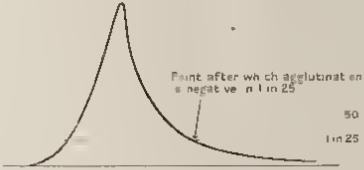


Diagram of agglutination curve.

(*b*) The percentage is calculated on a mixed collection of cases, and the proportion showing reactions due to typhoid infection occurs chiefly in the twelve to eighteen month period. A good many of these infected cases probably gave a low titre of agglutination before contracting typhoid and would have fallen into the negative group, which is thus to some extent reduced by their removal.

The next group, comprising those giving a positive in 1 in 25 dilution, is a small one. The curve produced takes on the whole a nearly horizontal course, showing a slight downward slope at first and rising again in the twelve to eighteen month period. This rise is probably accounted for by the fact that many of the next group (1 in 50) having fallen below this titre after twelve months, then take up a position in the 1 in 25 group.

The third group, 1 in 50, contains, after the negative group, the largest number of cases (265). The curve shows a steady fall from 28·2 per cent in the most recent six months to 20·8 per cent in

the twelve to eighteen month period. The titre of 1 in 50 seems the commonest which persists for any considerable time after inoculation.

The fourth group giving a titre of 1 in 25 shows a similar fall to that exhibited in the third, dropping from 13·2 per cent. in the most recent period to 6·3 per cent. in the twelve to eighteen month group. The figures, however, do not plot a straight line, there being a sharp drop in the twelve to eighteen month period. The comparatively small number of cases (twelve in the twelve to eighteen month group) may lead to some mathematical error in this case, but on the other hand it is quite probable that there is a considerable fall after twelve months in the percentage of cases giving a titre of 1 in 125.

The last group giving a titre of 1 in 250 or more, as shown previously, is undoubtedly composed chiefly of cases in which the reaction is due to typhoid infection. It shows, instead of a fall in the percentage as the time since inoculation increases, a marked rise, occurring especially in the cases in which twelve to eighteen months have elapsed since inoculation. This represents the higher incidence of typhoid in those cases in which there has been a lapse of more than a year since inoculation. The comparatively high percentage in the one to six month group period would be accounted for by the inclusion of cases showing agglutination in 1 in 250 due to the recent inoculation. Were these cases excluded the curve would show a much steeper drop in the recent period, resembling the dotted line in the chart.

Conclusions.

(a) *The Persistence of the Agglutination reaction after Anti-typhoid Inoculation.*—(1) In about a third of all inoculated persons the titre of the serum fell to below 1 in 25 in the first six months after inoculation and probably in most of these, early in this period.

(2) In the majority of those giving a persistent positive after inoculation the titre was 1 in 50 or less, of those inoculated twelve to eighteen months previously 17·2 per cent., giving agglutination in 1 in 25 and 20·8 per cent. in 1 in 50. A smaller proportion of cases, about 13 per cent. gave an agglutination in 1 in 125 which persisted for more than six months, but in the majority of cases, dropped below this after a year.

(3) Those showing a titre of 1 in 250 and over represent two

classes (*a*) Those in which the reaction is due to typhoid infection and (*b*) those in which it is due to inoculation In inoculated persons showing agglutination of 1 in 250 and over due to inoculation this titre was rarely maintained for more than six months In those cases in which the period since inoculation was more than six months a titre of 1 in 250 was the result, in the vast majority of cases of typhoid infection

(*b*) *The Diagnosis of Typhoid in Inoculated Persons*—The figures given in this paper represent the average for a large number of cases by far the greater proportion falling within the limits described No account is taken of individual peculiarities Hence although we may not be able to diagnose typhoid or the absence of typhoid in any particular inoculated person, diagnoses made on these lines will give a true picture of the incidence of typhoid in a large series of cases

The practical application of these results to the diagnosis of typhoid has been as follows —

(1) In general the serum must give a positive reaction in a dilution of at least 1 in 250 before it is possible to diagnose typhoid fever in inoculated persons on an agglutination test alone

(2) Even a positive in this dilution in a recently inoculated person (within six months) is not, as a rule the result of typhoid infection but of the inoculation In practice it was necessary to have some definite rules for diagnosing these doubtful cases of recently inoculated patients and the following were adopted —

In those cases which had been inoculated twice typhoid was diagnosed if the serum gave a positive in a dilution of 1 in 250 five months or more after inoculation In those inoculated once a similar titre four months or more after inoculation was considered as probably typhoid infection The reasons for the adoption of this rule were as follows Although we know that a titre of 1 in 250 within six months of inoculation is in a considerable number of cases due to this inoculation the number of cases in the series was not sufficiently large to be able further to analyse this group of recently inoculated cases. We do not know therefore for certain whether these cases showing inoculation effects only are distributed more or less evenly over the whole six month period, or are found chiefly in the latter half—i e , in those inoculated within three months or so—as would be expected In order to meet this last possibility as far as possible, and not to exclude any cases that might reasonably be considered as typhoid the above rule was adopted

[illegible] cases showing an agglutination in 1 in [illegible] since inoculation would contain a consi[illegible] and in practice it was assumed that [illegible] from typhoid

Working on the above scheme the [illegible] in the series of 1 024 cases was about [illegible]

A series of 115 cases of uninoculated [illegible] the same time as the above series and [illegible] agglutination tests thirty two cases [illegible] giving a percentage of 27 6

We can therefore say that of those [illegible] with intestinal disease not more than [illegible] lated had typhoid while at least [illegible] lated had contracted it [illegible]

THE INCIDENCE OF TYPHOID FEVER AND THE RESULTS OF ANTI-TYPHOID INOCULATION DURING THE SECOND YEAR OF THE WAR OCTOBER 1915 TO OCTOBER, 1916

By Fleet Surgeon P W BASSETT SMITH C B M R C P F R C S., R N

In the January (1916) number of this Journal, the results which could be gathered from the inoculation returns of 1914-1915 were set forth and the technique employed was described The same methods have been used this year, but the necessity of rest after inoculation has been emphasized and generally enforced

In the autumn of 1915 simple typhoid vaccine was used to a large extent, as shown in the table below, but during the present year a triple vaccine *Bacillus typhosus B paratyphosus* A, and *B paratyphosus* B has always been used for those proceeding to the Eastern Mediterranean, Persian Gulf, Russia, France and Belgium The typhoid culture selected was one isolated from a Gallipoli case This was lethal to a guinea pig and gave good agglutination reactions and is known as *B typhosus* (G.) The paratyphoid cultures five strains each of "A and "B were the same as those referred to in the last report

The composition of the triple vaccine prepared at Greenwich is —

B typhosus	500 millions per c c
B paratyphosus A	250 "
B paratyphosus B	250 "

For the first inoculation 1 c c is given, and for the second, 2 c c A triple vaccine is also prepared at the Royal Naval Hospital, Malta containing similar proportions of *B paratyphosus* A and B

Abstract of Returns which have been received

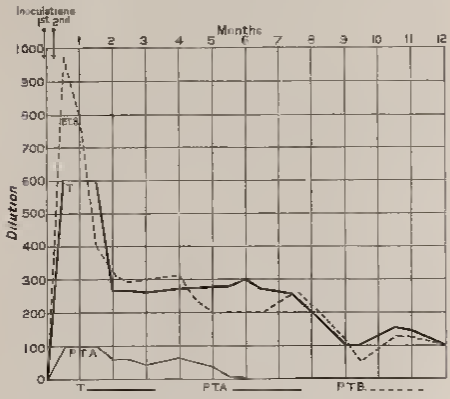
	Once	Twice
Typhoid		
Number of men inoculated 12 658	1 522	11 136
Triple typhoid		
Number of men inoculated 8 011	439	7 590
Number inoculated twice against typhoid		18 695

Comparatively few severe reactions or sequelæ were reported these rarely occur if proper precautions are taken It has been noted by some officers that the first inoculation produces much more severe effects than the second but this was certainly not universal One case was invalided from Haslar for epilepsy twelve days after the first inoculation and another was invalided subse-

quently [illegible] With [illegible] of 39 8/5 [illegible] there [illegible] a cord of [illegible] [illegible]ation at the [illegible] injection which speaks well for the care taken over the [illegible] operation

The annexed curves show the immunity reactions over a period of one year given by a laboratory attendant inoculated with two doses of the triple vaccine The response to typhoid and paratyphoid B has been good and lasting that to paratyphoid A very feeble

Agglutination Curve after use of Triple Typhoid Vaccine



Cases of Enteric Fever during the Year

In this period there were 29[illegible] cases definitely recognized as typhoid fever Of these forty five occurred among men of the general Naval Service who had not been inoculated Seven of these cases were in a small epidemic at St Vincent these forty five have not been included in the tables

The remainder were from the Mediterranean and western war

areas among those on whom inoculation had been carried out to a large extent. This statistical return is the result of an investigation of cases clinically diagnosed as enteric using this term in its widest sense.

The most detailed and valuable evidence is contained in a report by Fleet Surgeon Dudding from Royal Naval Hospital Haslar in which 1,000 cases are tabulated. (See Report by Dr. Fildes this Journal vol. ii, No. 3, pp. 311-312.)

R.N. Hospital, Haslar.

Total cases—1,000.

		Typhoid		Paratyphoid A		Paratyphoid B	
		Cases	Percent	Cases	Percent	Cases	Percent
[illegible] inoculated	197	31	24.4	19	10.2	14	11
[illegible]	61	9	14	4	7.8	[illegible]	1.8
[illegible] since	800	82	10.1	60	7.1	39	11
		124		83		108	

From Plymouth, Chatham, Portland and Malta records of 1,416 [illegible] cases were received, giving the following results:

		Typhoid		Paratyphoid A		Paratyphoid B	
		Cases	Percent	Cases	Percent	Cases	Percent
[illegible] inoculated	199	71	35.6	31	16.5	21	10.5
[illegible] since	28	8	28.5	1	15.7	4	14.1
[illegible] since	412	49	11.6	131	31.2	95	23.0
		128		168		120	

Mixed infections were occasionally present. In the second group of cases the percentage of paratyphoid among the inoculated was high as very few cases except typhoid and paratyphoid were included in the returns. A great many of these occurred in the returns from the men who probably not received any protection by vaccine against these fevers.

Judging by the inoculation curve given above, the immunity resulting from the paratyphoid A vaccine is only slight and short lived, indicating the desirability of making the vaccine still more polyvalent.

The reduction in the incidence of typhoid is marked in both groups. The percentages given above are only those found in cases suffering from intestinal fever attacks, but if the total number of men twice inoculated is considered the results for typhoid show 18,696 men with 131 cases or 0.7 per cent.

THE SHATT EL ARAB RIVER WITH SPECIAL REFERENCE TO MALARIA

By Surgeon Q H RICHARDSON, R N

The Shatt-el-Arab extends from Gurna where it is formed by the junction of the Tigris and Euphrates to the Persian Gulf a distance of some 120 miles

The word 'shatt means "fresh-water river, and though tidal throughout, the Shatt-el-Arab is fresh water from its source to Fao a small village and telegraph station nearly at its mouth

The width is variable mostly from a half to a quarter of a mile though in places less, whilst the banks are extremely low lying—seldom more than a few feet above high-water level

At intervals along the mud flats and shallow water of the fore shore, curious structures are seen made of reeds closely set upright in the mud, in somewhat the form of a query mark, the arm of which commences at the river bank whilst the loop extends downwards into the water These are fish traps and at low tide when the whole contrivance is out of water any fish which entered but failed to leave the loop before the receding tide uncovered the opening, are picked up

Behind the river banks the land stretches away as a flat plain though here and there isolated mounds and areas of slightly higher lying land occur which are usually selected by the natives to build their mud or reed huts upon, and thus render their dwellings immune from the annual floods which take place Those who do not observe this precaution often find their abodes inundated though apparently this is not regarded at all seriously as in this case the family canoe or bellum is simply floated into the hut, and the native continues a placid existence therein surrounded by his wives, children, and livestock

The flood season, which is said to depend more on the snow melting in the Caucasus and on conditions affecting the tributaries at a distance than on local rain, lasts from April to July To guard against this, mud banks or bunds are constructed along the lower lying portions of the river banks reinforced very often by the trunks of old date trees These bunds are frequently inadequate with the result that it is not unusual for large areas of land to be completely submerged To gain some idea of the extreme flatness of the country, it is only necessary to recall the fact that Bagdad

[illegible]

[illegible] along the river banks [illegible] the [illegible] depending solely on irrigation which is effected by numerous shallow irrigation channels, constructed at right angles to the main river, and which are joined inland by systems of cross channels These are filled and emptied by the tide with the result that those trees nearer the river receive a far more constant supply of water than those further inland and flourish accordingly The present width of the date belt varies from a few hundred yards to half a mile or more which is the maximum distance under the present conditions, that the water will flow up the irrigation channels before the tide turns

Above Busreh the belt loses its complete continuity, and one finds intervening areas of bare desert stretching away to the horizon In the neighbourhood of Gurna one of the supposed sites of Eden enormous areas of land are, during the flood season completely inundated each year, and often no attempt is made at bunding Here reeds grow luxuriantly to a height of ten or more feet the river course being alone distinguishable as an area free from their growth

During the winter in the Shatt-el-Arab duck and snipe are plentiful and good shooting is easily obtainable, whilst in the summer fair sport can be had with rod and fly Bathing is unfortunately unsafe owing to the presence of sharks, which enter the river in the hot months and are said to run up as far as Bagdad

The date belt, which might be termed the inhabited area proper, is in many places actually below the high water level, and here it is often not the main river bund which proves inadequate but rather the banks of the small irrigating channels inland, the result being that the contained plantation is converted into a swamp Under these conditions weed growth takes place rapidly thus completing all the necessary factors for the ideal habitation of the mosquito, i e heat, moisture, slowly running or stagnant water and vegetation

This flooding is not altogether without advantage, however for it enables a rich deposit to settle from the water on the land but it is hardly to be wondered at that malaria should be prevalent The season lasts from April to December The usual form met with is the benign tertian but the subtertian is not uncommon, and it seems probable that the advent of a large expeditionary force many of whom are Indian—will increase the malignant ratio

[illegible] and it said in [illegible] indignant [illegible] at Basrah [illegible] to Muskat the [illegible]

During the present commission the ship [illegible] serving first visited the Shatt-el-Arab in March 1911 [illegible] brief stay was made at Basreh then a Turkish port On arrival a patriarchal Turkish official presented himself at the gangway with the query "Any rots?" Observing bewilderment on the [illegible] the officer of the day, he forthwith courteously relieved that [illegible] of further anxiety on the matter by exclaiming, "No rots [illegible] well, good bye!" and precipitately disappeared This was interpreted as signifying that the Turkish Government was satisfied there was no plague on board

This visit only lasted a few days and no malaria followed Our second visit took place in September 1914, when we proceeded to Mohammerah, remaining there for about a fortnight At this time relations were becoming strained with Turkey, and one hot forenoon a Turkish officer came on board with instructions from his Government requesting us to leave Reply was made that the representation would be at once transmitted to the proper quarter, but that pending reply the ship must remain

The officer was then offered refreshment but to the general consternation asked for sherbet The Goanese steward was determined not to be defeated, and quickly produced what was apparently the required beverage, which was pronounced by the emissary as most excellent The latter then hurriedly departed On inquiry, it was ascertained that the said beverage consisted of lime juice and water in which was incorporated, however, a very generous percentage of Eno's fruit salt

We left a day or two later and war followed almost immediately Five cases of malaria resulted from this visit to the Shatt el Arab, all of which were benign tertian

Throughout nearly the whole of 1915 the ship was in the Shatt el Arab and during that period forty-seven cases of malaria occurred Of these forty-one were tertian the remainder being subtertian the average time patients remained on the sick list being a week During the greater part of the year 20 gr of quinine were given weekly to each member of the ship's company as a prophylactic but it became evident that this amount was insufficient and when larger doses were employed, it was comparatively uncommon to get malaria in any but those who had

already had an attack The general tendency was for benign attacks, if repeated to ultimately become malignant Parasites were nearly always easy to find even in the pyrexial stage, whilst in the malignant form double infection of the red cell was often observed

As regards differential diagnosis, the conditions particularly liable to simulate malaria are typhoid, sandfly and simple continued fever The points to be chiefly relied upon are, repeated examinations of the blood, Widal's test and the character of the temperature, but it must be remembered that the latter becomes unreliable as soon as the air temperature exceeds 98° F, an almost everyday occurrence in the hottest months A fever, which at first sight appears to be malaria but which lasts for more than a week, is very likely, in the absence of parasites in the blood or definite intermissions to be typhoid

The routine treatment has been quinine in solution by mouth, which has always cut short the attack The daily doses employed have been 20 gr for the first three days commencing in the sweating stage, followed by 10 gr, for three days and then 5 gr for a week, the latter usually combined with tonics Following this a regular amount of quinine is given weekly, the amount depending on the time of year

With regard to prophylaxis during the months January, February, and March, mosquitoes disappear and all that is necessary is 10 to 20 gr weekly to all old cases From April to December more vigorous methods are required, and it has been found in this ship that 30 gr of quinine a week to each man is the minimum dose that can be considered an effective preventive Probably as good a way as any of giving this is in a 5 gr dose taken with breakfast on six mornings in the week Screening the ship, in the excessive temperatures met with, when heat stroke even amongst upper deck men is hardly uncommon, is a measure quite out of the question All that can be done in this way therefore, has in the provision of mosquito sleeping nets, which are employed These, undoubtedly, ward off many bites, but many are still received in the evenings and when messing between decks

It has been observed that the natives at sunset, light their cooking fires usually to windward of their huts and it is reasonable to suppose that this is done to drive away mosquitoes A similar sort of measure, especially suitable for employment in the living spaces on board ship, consists in the use of katol sticks, which are comparatively cheap and easily obtainable from India These are

allowed to smoulder and give off a vapour which at once drives away or is fatal to mosquitoes In the Royal Indian Marine a regular issue of this is made for use on the mess decks and has proved most effective

In the Shatt el Arab the main preventive of malaria in the future must lie in attacks on the breeding grounds and, doubtless when peace comes once more, a vigorous campaign can be made At Basreh where ships chiefly lie, swamps and stagnant pools should be totally preventable by adequate bunding and proper systems of drainage All weed growth could be cleared from the irrigation channels and then the numerous fish therein would more readily see and devour any larvæ Lastly, natives and others could be prevented from storing their water in open receptacles, as is largely done at present a practice which is a prolific source of breeding

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THE ANKLE JERKS OF A SHIP'S COMPANY

By Temporary Surgeon MILDRED CATHILL, M.A., M.D., M.R.C.P. (Lond.)

Late to the Royal Naval Hospital, Greenwich; Assistant Physician, Royal Hospital, Greenwich; Assistant Physician to the West End Hospital for Diseases of the Nervous System; Assistant Physician to the Victoria Park Hospital for Diseases of the Chest; Lecturer in the London School of Clinical Medicine.

In this paper it is proposed to [illegible] the question of the ankle jerks of a large number [illegible] men. With the exception of four officers every man in H.M.S. [illegible] was examined in this respect. An examination [illegible] who were in the ship temporarily [illegible] application.

Importance is attached to the fact that every examination was made by the same observer. Of the 1,052 men dealt with in the exception (Case 1) considered that they were healthy and strong. The ages of the men varied from 50 to 16.

Total absence of one or of both ankle jerks was found in fifteen cases. The remaining 1,037 were normal in this respect. Reinforcement was necessary in the case of forty-nine men before the jerks could be obtained, and in a few cases the result was achieved only with the aid of a heavy hammer. It was found occasionally that the outer side of the tendon was more responsive than the inner side [1]. The greatest care is needed before the jerk is declared absent. Not infrequently the jerk, which is apparently absent, is found to be normal at the next examination.

The expressions 'ankle jerk,' or 'Achillis jerk' are those in common use, and the phenomenon comes under the heading of the so-called 'tendon reflexes.' It should be remembered, however, that it is not a true reflex movement. It depends for its existence on reflex muscular tonus. When the condition of the jerk is examined in the manner described in a previous paper [2], that is, with the knee joint flexed, a positive result depends upon the soleus possessing this reflex tonus.

[1] This paper is a continuation of the article entitled "The Diagnostic Importance of the Ankle Jerk," which was published in the Lancet, April, 1916.

[2] *Lancet*, April 1916, p. 185. In multiple neuritis in which the motor fibres are affected, should read "In multiple neuritis in which the motor and sensory fibres are affected."

[illegible] tested the calf muscles are squ[illegible] ensure [illegible] This also brings before th[illegible] tiny [illegible] the muscles In some cases of [illegible] is associated with a diminution in the [illegible]

[illegible] Surgeon A Sanders R N has called my attention to the fact that the ankle-jerk is sometimes obtained when the calf muscles are struck and not when the tendon is struck I have been acquainted with the calf reflex for some time but I must plead guilty to having considered that when the tendon reflex was absent the calf reflex would be absent also and to having been satisfied with this consideration It is not the case however and in a large number of patients whom I have seen recently, and who have had absent ankle jerks from a variety of causes, I have been able to demonstrate brisk calf reflexes In a few cases both the calf and tendon reflexes are absent Perhaps the presence of the former and the absence of the latter in the same patient bears some relation to the stage of the disease I have not yet seen a case which showed a normal ankle jerk and an absent calf reflex The reflexes would appear therefore to be independent [3]

Of the fifteen abnormal cases three were the result of former infantile paralysis (Cases 1 2 and 3) Two men had evidence of sciatic neuritis (Cases 4 and 5) In one case (Case 6) the diagnosis of tabes was made without any difficulty and confirmed by an examination of the cerebrospinal fluid The remaining nine cases were not so straightforward It was proposed to lumbar puncture Cases 7 to 12 inclusive but by an unfortunate choice of date, the writer was appointed to Haslar when this had been done only in Cases 11 and 12 The diagnosis of the remaining cases therefore, is still uncertain (this is true also of Cases 11 and 12) and the reader will be able to come to his own conclusions from the facts which the clinical notes tell him The notes are given in brief but a careful clinical examination was made in each case and the neurological point of view was not made more dominant than the facts justified

Case 1 —G P aged 29 writer At age of 15 he had some illness affecting his legs but was never laid up He was turned over to the writer's department Gait awkward Both calves atrophied and anterior tibial muscles very weak Knee jerks normal Ankle jerks both absent Unable to stand on heels or toes

Case 3 —C S aged 28 leading stoker Found to have no ankle jerk on right side Knee jerks normal Gait normal Right calf measured 12 in left 13½ in Very slight weakness of dorsi flexors of

right ankle He said that as a boy he used to drag his right foot for about a week He never saw a doctor

Case 4—J S aged 41 stoker R N R Found to have no ankle jerk on left side Left calf measured 12 in right 13½ in Knee-jerks, gait &c normal He said that he had never been laid up and did not know that there was anything the matter

These three cases were examples of former acute anterior poliomyelitis

Cases 4 and 5—G P aged 29 private R M L I and F W, aged 32, gunner, R M A Both found to have absent ankle jerks on the left side and showed other evidence of slight sciatic neuritis When questioned they both recalled former cramps in the legs

Both these men had lost the gluteal fold on the affected side [4] I have not seen this fact described before, but I attach considerable importance to it in the diagnosis of sciatic neuritis There was no flexion of the thighs

Case 5—G P aged 41 chief E R A This man complained of nothing and considered that he was in perfect health His ankle jerks were absent also his knee jerks His pupils were unequal and reacted sluggishly to light and his gait was a trifle unsteady with his eyes closed His bulbo cavernosus reflex was absent No other abnormality was detected The cerebrospinal fluid contained fifty lymphocytes per cubic millimetre but the Wassermann reaction was reported to be negative The blood was not tested Lues was admitted

Case 7—F P aged 42 stoker single man No complaints Ankle jerks both absent Calves alone insensitive to firm pressure Bulbo cavernosus reflex not elicited No other abnormality was detected except that he had medullated optic nerve fibres visible to the left fundus Lues at 32 and had salvarsan in 1912 He said that the Wassermann reaction of his blood was negative in 1913 and 1914 Tabes dorsalis had to be considered, but it could not be confirmed for the reasons given above

Case 8—J W aged 38 stoker P O single Both ankle-jerks absent Achillos tendons and calves absolutely insensitive to pressure and testicles but slightly sensitive Bulbo cavernosus reflex not elicited Lues denied Blood and cerebrospinal fluid not examined

I am not quite certain in my own mind of the exact value to be placed on the absence of the bulbo-cavernosus Of my series it was absent in Cases 6 7, 8 9 and 11 It is said to be abolished frequently in early tabes I tested it in a number of men to their great amazement, and found it absent almost as often as I found it present As a rule when it is present there is no doubt about it It may be that in my cases some blunting of the normal sensibility had occurred at the extreme proximal end of the reflex arc We can say that the presence of the reflex indicates an intact reflex arc at the level of the third sacral segment

Case 9 —C K, stoker P O, aged 39, married wi[illegible] Right ankle jerk absent Left normal Has had cra[illegible] ing for a year or so but has never required a doctor Th[illegible] worse Complete analgesia of ulnar nerves at elbow, [illegible] tendons, with partial analgesia of testicles Bulbo cav[illegible] reflex absent Lues not admitted Blood and cerebrospinal fl[illegible] Probably a case of tabes No other abnormality was [illegible] The optic discs were not examined

Case 10—G L aged 30 E R A, married Right [illegible] jerk absent with reinforcement Bulbo cavernosus reflex [illegible] Achilles tendons absolutely insensitive to pressure calves and testicles nearly insensitive Says that his right sole has been cold for about a year and that his right great toe nail has dropped off painlessly about sixteen times during the last five years His left great toe nail came off also several times but has not done so during the last two years His right toe nail was seen to be black Gonorrhœa was admitted His wife has had one miscarriage and her two children twins, died as babes

It was exceedingly unfortunate that no opportunity was afforded of examining this man's cerebrospinal fluid, in order to prove or disprove the question of tabes

In all cases a complete examination was made of the sensibility of the skin to cotton wool touches to temperature and to pin pricks, of the sense of vibration of the tuning fork of muscular weakness wasting and ataxia of the condition of the deep superficial, and organic reflexes of the sense of joint position, of the condition of the pupils cranial nerves, optic discs and visual fields, of the muscular tonus of the presence of trophic disturbances &c Inquiries were made into the question of sexual power lightning pains, previous diplopia, &c In each case the facies and mental condition were normal and in no case was it evident that alcohol was a factor in the abolition of the jerks Examination of the heart and urine detected no abnormality

Case 11 —C R aged 29 carpenter's clerk Absence of the left ankle jerk detected Cremasteric and bulbo cavernosus reflex absent on repeated examination Joint sense abolished in toes only on each side Old depressed scar on vertex from injury in childhood

This rating denied sexual intercourse and although I believed him I was anxious to prove that he had not an early para syphilitic condition His cerebrospinal fluid proved to be absolutely normal and gave a negative Wassermann reaction The diagnosis remained uncertain

Case 12 —W R, aged 39 A B, R F R Absent left ankle jerk Joint sense absent in toes of right foot only Some diminution of tendernesses on squeezing calves and testicles No other abnormality detected, and with so little to work on a certain diagnosis was not possible

The cerebrospinal fluid was normal and gave a negative Wassermann reaction.

Case 13.—T. D., aged 18, stoker. Total absence of ankle jerks and knee jerks. No other abnormality detected. Bulbo-cavernosus reflex active. Venereal disease denied. There was nothing in the past history or family history to help in our enquiry.

Finally Cases 14 and 15 were two wardroom officers in whom I entirely failed to elicit the ankle jerks even on repeated examination, and with various forms of reinforcement. In one case I thought once that I did just elicit them, but I was very uncertain. Neither of the officers presented any outward evidence of illness which could be detected by their messmate during an intercourse of eighteen months and six months respectively. As no complete examination was made of these two men it will perhaps be better to be satisfied with a mere allusion to them rather than to include them definitely among the statistics brought out by the examination of the ship's company.

Enough has been said to show the real importance of examining this reflex. Ten years ago Ferrier [5] remarked that the best known and most commonly tested tendon reflex was the knee jerk, though the Achilles jerk is of equal or even greater importance, and yet but little attention is paid to it by the profession as a whole. We are now from our own researches able to say that its absence is evidence of a pathological condition. In no case out of the first thirteen of our series was its absence unassociated with any other abnormal condition.

I wish it to be noted particularly that in the case of fourteen of sixteen men such discoveries as were made were the result of a careful search. The men complained of nothing.

I lay no particular stress on the absence of the joint sense when confined to the toes only. It is surprising to think that this can occur in health. But I have met with it so often that I can hardly doubt that it does do so.

There can be no question that every man who is investigating disease from a clinical standpoint should possess and use a percussion hammer. It is of equal importance with the stethoscope. A well balanced paper knife makes a fair substitute on occasion.

It must be remembered that loss of the Achilles-jerk may be the only signal affection of the nervous system in cases of alcoholism and diabetes. I have seen several such cases in alcoholics. Presumably it is the solitary sign of a neuritis. On one occasion I based my report in a compensation case on the

absence of the ankle jerk in the limb in question. Fortunately I determined to see the man again and on this occasion the jerk was elicited.

I look upon Cases 8, 9, and 10 as most probably instances of tabes. Their future will be eagerly watched as far as it is possible for me to do so. With reference to Case 13 congenital absence of the knee jerks has been looked upon as one of the stigmata of degeneration (so also have unilateral optic atrophies, Case 7), and no doubt absence of all the deep reflexes may be explained in this way, but unfortunately such an expression does not help us to know in what way—anatomical, pathological, physiological—the possessor of such a stigma differs from normal people. In any case a stigma of this kind is so exceedingly rare that it need hardly be taken into consideration. Just recently I have seen a dull witted young man, aged 20, whose ankle jerks were both absent and who presented no other signs of disease.

The examination of the ship's company took place in January, 1916. This is mentioned in the interest of future investigators of the abnormal cases. The lumbar punctures were made on board and the fluids were examined by the Director of the Royal College of Physicians of Edinburgh, to whom they were posted. My best thanks are tendered to him and to my old shipmates for their hearty co-operation in my investigation.

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A BATTLESHIP IN ACTION

By Fleet Surgeon E A Penfold M B D S.O R N

It is thought that a short account of the experiences of the Medical Officers in this ship during the Battle of Jutland on May 31, 1916 and afterwards until our return to the base, may be of interest to other Medical Officers, as they differ somewhat from those so ably described in the October, 1916 number of this Journal inasmuch as most of our arrangements and general organization were upset early in the Battle owing to the Fore Medical Distributing Station (which was our principal dressing station) and the Medical Store adjacent, being completely wrecked by an explosive shell so that all the most important medical stores, surgical dressings and instruments were either destroyed or rendered useless, at the same time as most of our serious casualties occurred

In ships of this class there are two Medical Stations arranged for in the design of the ship the larger one in the fore part situated on the middle deck amidships and the smaller one in the after part of the ship on the same deck but nearer the ship's side The former was regarded as being in as safe a situation as could be obtained and the space provided as well as the ventilation fixtures and fittings in the station were most satisfactory and a very great improvement on the accommodation provided in ships of an earlier class

The After Station was regarded as not quite so well protected and it was recognized that it might be necessary to abandon this Station during action and for the medical party stationed there to take up another position further away from the ship's side Both from its situation and accessibility, as well as from its much larger size, the Fore Station was therefore recognized as the principal one in all respects

Medical Parties

Besides the Medical Officers and Sick Berth Staff, the medical parties consisted of the Chaplain, Fleet Paymaster, an Assistant Clerk and various ratings detailed to assist the Medical Officers in action as well as those told off and drilled as stretcher parties they were divided into two groups as follows —

(i) In the Fore Station were the Fleet Surgeon, one Surgeon, Chief Sick Berth Steward and two Sick Berth Attendants, assisted

by the Chaplain, Fleet Paymaster, two Ship's Stewards two Ship's Cooks, two Officers Cooks and two Officers Stewards to all of whom special duties were assigned Attached to the Fore Station and taking shelter there were five stretcher parties with one field stretcher and four Neil Robertson stretchers the field stretcher being manned by Cook's Mates two of the Neil Robertson's stretchers by Musicians, and two by Officers Stewards a leading hand was in charge of each stretcher party and was provided with a first-aid haversack

(2) In the After Station were the Senior Surgeon Second Sick Berth Steward and one Sick Berth Attendant assisted by the Assistant Clerk Chief Writer and two other Writers two Ship's Steward Assistants Officers Messmen and Cooks Attached to the After Station and located in the flat just outside it were three stretcher parties with one field stretcher and two Neil Robertson stretchers, manned by Officers' Stewards and Officers Cook's Mates, each being in charge of a senior hand with a first aid haversack

The medical parties (including the stretcher parties) had continually received instruction in first aid from the Surgeons during "action stations and those not previously qualified had been examined and passed out by me after the first three months of the commission The stretcher parties were continually drilled at their duties during the weekly 'exercise action, and were frequently sent for to various parts of the ships by the Commander when exercising the "repair parties or "fire parties The "fire" and "repair" parties also received a little elementary instruction in first aid especially as regards the treatment of burns and scalds, and the arrest of hæmorrhage being sent to the Surgeons for instruction a few at a time as they could be spared The gun crews had all received a course of instruction in first-aid either at Whale Island or in barracks after they had been detailed for this ship, but before commissioning, afterwards they were given additional instruction when they could be sent to the Medical Officers for this purpose Demonstrations in first-aid and ambulance work had been given by me during the previous winter evenings to Wardroom Gunroom and Warrant Officers separately, and all three courses had been very well attended

First-Aid Dressings

Adjacent to each 6-in gun on the battery deck is a small iron tank or cupboard (measuring 11 by 10 by 7 in) originally intended for stowage of cleaning rags &c for each gun's crew but which

was gi[illegible] perm[illegible] are div[illegible] and in these are kept [illegible] for burns first field dressings and packages of lint cotton wool bandages safety pins &c sterilized and sewn up in mostly battiste covers, orders are given for these not to be touched except in action, and the cupboards are kept fastened by a butterfly screw being only opened for weekly inspection by a Medical Officer a red cross is painted on the flap door of each cupboard Besides these two large tin dressings boxes (measuring 20 by 12 by 10 in) are kept full of additional dressings bandages, tourniquets safety pins, scissors bottles of surgical iodine solution &c these boxes are kept locked up with a padlock which is taken off during action A red cross is painted on their lids and when preparations are made for immediate action, they are placed at the fore end of the battery deck, port and starboard For all other isolated positions haversacks are provided containing packages of lint cotton wool bandages, safety pins &c sewn up in mostly battiste also picric acid dressings first field dressings tourniquets and scissors the quantity of dressings contained in the haversack differing according to the number of men in the station to which they are assigned Forty-seven of these haversacks are provided each being sealed up with wax and having painted on it besides the red cross the name of the station for which it is intended, they are kept in the Medical Distributing Stations and are served out to the ratings told off to take charge of them whenever preparing for action

STORES KEPT PERMANENTLY IN THE DISTRIBUTING STATIONS

(1) *In the Fore Station*—Operating table, basin holder and instruments table, instrument chest one medicine chest (complete), two emergency surgical dressings chests cases of izal and formalin, X ray apparatus and ice-chest In the cupboard and drawers provided are kept surgical dressings of all sorts, iodine, carbolic acid, antiseptic paste, perchloride of mercury tablets, morphia in solution and in tabloids, Wildey's syringe &c cotton shirts and towels, operating gowns and white clothing are kept in tin boxes and large quantities of splints, made by the carpenters of thin three-ply wood which can easily be cut down if required, are kept on the shelves Twelve bamboo and canvas stretchers were kept hanging in tiers of three in the Fore Station, and it was arranged that others could be fitted up in various bathrooms if required

[illegible] were kept permanently [illegible] After Station [illegible] six more can be slung in the flat [illegible] adjacent [illegible] Wardroom Officers bathroom All [illegible] dressings and stores not actually required for use in [illegible] work in the sick bay were kept in the Medical Store [illegible] adjacent to the Fore Station and accessible during [illegible]

Usually when ordered [illegible] action there had been plenty of time [illegible] the sick bay till the other articles required in the [illegible] stations, as well as all books papers, and documents which [illegible] importance and this had been done on many occasions [illegible] so that the sick berth staff and ratings told off to assist [illegible] get the sick bay dismantled and everything important [illegible] knowing exactly what was required to be done On [illegible] the time for preparation was very short, and when [illegible] it was known that the enemy had been sighted [illegible] medical parties and sick berth staff immediately proceeded to remove all the stores remaining in the sick bay to Distributing Stations or to the Medical Store The sick berth beds and bedding were removed to the store where they would be available when required all the remaining instruments for ready use sterilizer electric heater instrument trays, urinals and other requisites in daily use in the sick bay or operating theatre were taken to the Fore and After Stations the medical history sheets had been packed in a special tin box and were also removed to the Fore Station and as much of the furniture as could be stowed there to the Store Room In twenty minutes after ' action sounded, and before the firing commenced, the sick bay was stripped and the watertight hatchway leading to it closed down Those of the patients on the sick list who were considered fit to go to their proper action stations had been previously warned to do so, if there should be an action, but on this occasion there were unfortunately, several more cases than usual on the sick list chiefly owing to a number of boys and ordinary seamen having been vaccinated recently, and some of them had been placed on the sick list as cot cases that day, with febrile condition and painful arms, these had to be accommodated in the Fore Station, as well as a few patients with injuries such as sprains, &c who would not have been of any use in their proper action stations

When the action commenced all the arrangements in the dressing stations had been completed, the necessary instruments sterilized and laid out in trays lotions made up morphia solution in Jena bottles, &c, and the staff clean and ready for their work Only one slight casualty had come to the Fore Station during the first hour of the action and this had been dressed, the man would have been sent back to his post, but just after dressing his wound a heavy shell burst close to us in the fore part of the ship and completely wrecked the Dressing Station and Medical Store causing many casualties in this part of the ship

On recovering from the effects of this explosion, it was found that all the lights were out in our compartment which seemed to be filled with debris, and the air thick with smoke from the adjoining store room which was on fire but no flash had been felt and no nitrous fumes were noticed water was rushing in (from burst pipes) and the compartment was quickly flooded the uninjured men were crowding towards the corner of the compartment where there was some light from the deck above coming through the hatchway All the unwounded were sent up as quickly as possible, but there was a little delay owing to the ladder being damaged by the explosion In two or three minutes the place was cleared of all except the Medical Officers and sick berth staff and those who were helpless Surgeon Margetts and myself were practically uninjured and were able at once to attend to the wounded with the assistance of one sick berth attendant (who was afterwards found to be slightly wounded in the leg by a shell splinter) the other two sick berth ratings stationed with us were both found to be seriously wounded, and one died shortly afterwards Several Neil Robertson stretchers were found in the least damaged part of the station, and the wounded were fastened in them as quickly as possible and carried up to the deck above, where they were laid either on mess tables or on field stretchers on the deck, and a temporary dressing station was arranged on the stoker s mess deck

All the wounded from the fore part of the ship (where most of the casualties occurred) were afterwards brought to this station Very little in the way of dressings was salved from the Distributing Station or Medical Store as what was not destroyed by shell explosion or fire was damaged by water so that at first only temporary dressings which could be obtained from the nearest guns or isolated positions were available, but as soon as there was a lull in the action a surgical emergency dressings chest was brought from the After Station, the two in the Fore Station being

much damaged apparently though afterwards most of the contents were found to be serviceable The Wildey's syringe and bottle of morphia solution which were carried on my person had not been broken, and at first none other was available all the other hypodermic syringes and prepared solutions of morphia having been destroyed although later on others from the emergency chests and field haversacks were obtained I may here state that the Wildey's syringes were found to be most valuable both by myself and by the surgeon stationed aft their only defect being that the needles are too fine and very easily broken Telephonic communication between the two stations had of course been interrupted when the Fore Station was put out of action and no other communication was possible until there was a lull in the action but when this did occur, the second sick berth steward was sent for to assist in the Fore Station, and some dressings and other necessaries such as urinals feeding cups &c , were obtained It was now reported to me that Surgeon Lyster had found it necessary to abandon the After Station The Surgeon and party of men with him had removed to the engineers workshop and store-room which had been quickly arranged for their use, with the able assistance of the chief stoker in charge there Many of the cases of serious burns, which resulted from cordite fires were dressed in this temporary station and the patients made as comfortable as was possible there, until it was safe to have them removed to a less well protected part of the ship

A few of the severe cases of burns, as well as all those wounded in the fore part of the ship had been removed to the temporary Fore Station on the stokers mess deck and dressings and splints were applied there and hypodermic injections given to all those requiring them the chief difficulty was to cleanse the wounds, which were of course in a very dirty state even cold water was at first only obtained with difficulty and no hot water was available until much later when it was safe for cooks to return to the galleys, and the amount was then limited to what was required for bovril, tea cocoa &c until the fresh water supply pipes had been repaired

Lubin and methylated spirit were obtained from the dressings boxes, and this was the only antiseptic available when first the wounds were dressed

Mortuary —It was found that eighteen had been killed outright by shell explosion in the fore part of the ship eight others after were added of wounds the majority during the evening of May 31 A mortuary was established in a screened off part of the mess deck

in the compartment before that used for the temporary dressing station until the dead were all removed there either by the Communal repair parties or by the medical party. Large quantities of disinfectant solution were required for use in the mortuary. At first only a few tins of izal were available but later a case of izal was obtained from the After Station as well as disinfectant solution from the carpenter's stores.

Cases which died of Wounds.—Most of these had sustained multiple injuries from shell explosion; several of them had one or more compound fractures, especially of the lower limbs and particularly the thigh, associated with large gaping wounds from shell fragments elsewhere. One case was that of an able seaman with a compound fracture of the cranium, who lived for several hours although the left side of the skull was blown away and the brain exposed and lacerated; another patient who had been resting in the Medical Station sustained a compound fracture of the spinal column in the dorsi-lumbar region, the injury being caused by a fragment of shell about the size of a man's fist; he was entirely uninjured elsewhere and lived until the early morning of June 1. One case of severe burns of the head and trunk with multiple wounds from shell fragments, died almost as soon as his injuries had been dressed; another case of compound fracture of the thigh with severe lacerated wounds on both sides in the region of the hip joints and lesser wounds of the legs survived until the morning of June 2. These patients had all been wounded either in the Fore Medical Distributing Station or in a part of the ship near it and it had been possible to remove them direct at once to the temporary dressing station for treatment. Another man who had been stationed in a more distant and isolated position had been struck by a large piece of shell at the same time as the others were injured but could not be removed till later when there was a lull; he was found to have sustained a compound fracture high up in the thigh and of the foot the lower part of the abdomen being also injured. He was temporarily attended to by a Medical Officer, and later removed in a Neil Robertson stretcher to the stokers mess deck, where treatment of his injuries and of shock were given but he died about an hour after his removal.

Other Casualties.—Besides those who were killed or died of wounds forty-two other casualties occurred, twenty-seven of which were burns (nineteen severe and eight slight), thirteen were cases of wounds (five severe and nine slight) and there were two cases of

both wounds and [illegible] In [illegible] cases one had sustained a compound fracture of the [illegible] with [illegible] of the thighs higher up, as well as a punctured wound of the abdominal wall caused by a fragment of shell another was found to have sustained a severe contusion of the peritoneum, resulting in ruptured diaphragm as well as a compound fracture of one foot near the ankle joint and wounds of the other foot One case of scalp wound caused by shell fragment was also suffering from the effects of nitrous fumes and was therefore regarded as a severe case of injury another case, at first regarded as a slight one was that of a deep punctured wound in the groin, apparently caused by a fragment of shell remaining in the wound

The slight cases of wounds were mostly caused by shell splinters or fragments but some were cases of severe contusions and abrasions due to men being violently thrown as a result of shell explosion

Burns—Most of the burns occurred in 6 in gun s crews or ammunition parties and were due to cordite burning but a few were sustained in the engine room department caused by flash from shell explosion passing down a ventilating trunk In all cases these burns were of the face neck and hands the forearms also being generally burned in the case of seamen in nine of them were the parts of the body covered by clothing burnt and in none of them were the eyes damaged although the eyelids generally suffered severely These cases were all dressed with picric acid dressings but in some cases oil was applied to eyelids, nostrils and lips, where the picric acid dressing could not be satisfactorily kept in position In most cases the protective was used in order to keep the dressings moist, and although those which were kept moist were more easily removed, they more quickly became offensive than those in which no protective was used, nearly all the burns were highly septic and could not be satisfactorily cleansed before being first dressed These cases were nearly all redressed in the morning (June 1) and all of them were again dressed in the evening by which time they had become very offensive and many of them were so painful and the patients themselves so restless that it was difficult to keep their dressings properly applied Injections of morphia (⅙ gr to ½ gr) were given in nearly all these cases of burns Most of them again required dressing on the morning of June 2

Arrangements after the Action—It was not until the afternoon of June 1 that the "secure" was sounded and the sick bay

compartment could be opened up, it was then found that the bay was practically undamaged, and it was quickly prepared for the reception of patients. Beds and bedding were obtained from the ship's steward to replace the sick berth bedding which had all been destroyed in the Fore Distributing Station and Medical Store. As many of the patients as could be accommodated there were removed to the sick bay, especially those which required more thorough cleansing and dressing of their injuries which was carried out in the operating theatre of the sick bay by Surgeon Margetts and myself. Two of those dangerously wounded (one of whom died next morning) were not removed from the mess deck but were kept there in cots, a space being screened off for them and an attendant remaining with them. Most of the cases of burns which could not be accommodated in the sick bay when removed from the engineer's workshop and store-room were placed in the chapel (aft) which was undamaged in the action and proved a very satisfactory place for this purpose, the chairs all being removed and the patients laid on beds and hammocks spread on the deck. It was then possible to give individual attention to them all. Several of the ratings who had been trained in first aid and whose services could be spared volunteered to continue nursing the patients and this service was of the utmost importance to the Medical Officers because of the sick berth staff being so depleted and those remaining considerably [illegible] by the prolonged strain of the previous twenty-four hours.

Nearly all the cases of burns required feeding with feeding cup [illegible] and frequent relays of bovril, soup, cocoa, and milk foods were [illegible] obtained from the galleys and distributed amongst the patients. The volunteer nurses attended to the feeding of all the helpless patients as well as providing them with urinals, bedpans, [illegible] when required. Two of the assistants who were writers took [illegible] and full particulars of the patients. I may here [illegible] that I am deeply grateful to these assistants for the way they gave their help in time of stress, although themselves badly in [illegible] I was surprised as well as pleased at the skill and [illegible] several of them showed in nursing their suffering [illegible].

Surgeon Lyster remained in charge of the patients in the [illegible] by volunteer nurses and he redressed cases there [illegible]. The second sick berth steward and the uninjured attendant [illegible] required for nursing purposes in the sick bay and on the [illegible] mess deck with two volunteer assistants.

[illegible]

W[illegible] the [illegible] the [illegible] early in the afternoon one of [illegible] side us and the hospital patients [illegible] being discharged and nine ([illegible] the ship for treatment. The cot cases [illegible] from this ship to the hospital ship [illegible] the cot-carrier or to hoist any of the [illegible] working party the transfer was very [illegible]

After history of some of the [illegible] — [illegible] been able to trace the after history of [illegible] hospital only one of the serious cases (burns) died [illegible] June 20). One other who was severely burned [illegible] to hospital and ten weeks afterwards on sick [illegible] burns was eight weeks in hospital and four [illegible] but in case two did not return to the ship. Another [illegible] return to August 23, was hit only for light [illegible] afterwards the left forearm, wrist and hand [illegible] and the cicatricial skin tending to [illegible]. Several of the other cases returned to the ship after periods [illegible] in hospital, followed by two in [illegible]

Of the severely wounded patients [illegible] pound fracture of the leg and [illegible] wall, was in hospital for five months [illegible] fairly satisfactory recovery but [illegible] age he will probably not return [illegible] who had compound fracture with lacerated wound of the [illegible] well as ruptured urethra had an amputation of the [illegible] performed in hospital but otherwise is completely cured.

The case of scalp wound with symptoms of poisoning by nitrous fumes made a good recovery and returned to the ship about six weeks after he was sent to hospital. The case of punctured wound of the groin due to shell fragments was only about five weeks in hospital, but did not return to the ship till much later.

Application was made by the captain for the wounded to return to the ship, if possible, when again fit for active service, as they had all made special requests to be allowed to do so. Twenty of the thirty-three patients sent to hospital did return, and of these five have since been discharged as cases of neurasthenia apparently resulting from the effects of the action. Several of the others who returned from hospital were affected to a lesser extent, but gradually improved and are now apparently quite well again. One man who

had only [illegible] hospital for three weeks for burns of face and hands [illegible] tremors of the hands and was unable to continue [illegible] a washroom servant owing to this cause. He [illegible] from insomnia and persistent headaches.

Insanity.—[illegible] shortly after the action and apparently as [illegible] The patient was an artificer and was not wounded [illegible] that he had been much distressed and upset by [illegible] shell near to him as a result of shell explosion. He was [illegible] hospital four weeks after the action and was subsequently [illegible] insane.

Lessons learnt from the Action.—(1) That only the Neil Robertson stretcher should be used for transporting wounded to the dressing [illegible] the field stretchers being utilized for accommodation of the wounded afterwards.

(2) That [illegible] such list should be as few as possible in war time and that [illegible] cases as are quite unfit for duty at the [illegible] stations should be sent to the hospital ship at the base as possible. In [illegible] to send especially such as are unable to walk or take care of themselves.

(3) That it [illegible] to have two Medical Distributing Stations of equal importance in a central position in the ship, from each [illegible] be obtained in a well protected part. In this ship [illegible] the Battle of Jutland the Distributing Stations have been arranged in strongly protected situations near the centre of the ship one on the starboard side [illegible] a watertight transverse bulkhead and the other on the port side before the same bulkhead. [illegible] as regards [illegible] accommodation so that the [illegible] equipment in both between them is equally as [illegible]. Well protected accommodation for the stretcher parties [illegible] (if any) has also been arranged for in the hammock and [illegible] as identical to the Distributing Stations.

[illegible] a premeditated signal made from the conning [illegible] which side of the ship is engaged in the [illegible] that if the port side is engaged all the stretcher parties [illegible] quickly enough to remain on that side can at [illegible] with their stretchers &c. to the starboard side [illegible].

(4) *The Injuries Inflicted from Flash or Flame.*—More than half the casualties in this ship (exclusive of those killed or died of wounds) were cases of severe burns as these burns were almost entirely confined to the exposed parts viz. face, neck, hands and forearms it is [illegible] that if these injuries would be rendered

[illegible] the person is uncovered [illegible] exposed to flash [illegible] the wearing of non-inflammable [illegible] and gauntlets [illegible] partially exposed to the [illegible] or flash from shell explosion is a wise precaution. The articles must be of such a kind that they can be worn for several hours if necessary, without much discomfort; therefore the material must be thin though fire proofed and the eyes, nose and mouth must be exposed (except in the case of those actually engaged in putting out fires or working in dense smoke or fumes). The relatively small amount of surface so exposed to flash would render the burn sustained a slight one comparatively and the injured man would probably be able to continue in duty after anointing the damaged part with an ointment or oil. From what has been learned in this ship, as well as from others in this squadron the eyes themselves and inside of the nose and mouth are probably undamaged by flash. The repair and fire parties must of course be provided with a helmet which gives more complete protection and which is only put on when actually engaged in combating fire.

As an additional dressing for burns sterilized olive oil with 5 per cent eucalyptus oil and 10 per cent lime water is now provided and kept in air tight tins (easily opened if necessary) distributed in various parts of the ship. Boracic ointment is also provided at the 6-in guns.

(*c*) *Accommodation of the Wounded after Action.*—As regards the various schemes for distribution and accommodation of the wounded, it seems certain that they must be kept in the Medical Distributing Stations or other equally well protected places probably for many hours, until the ship is out of the danger zone and there is no likelihood of any further fighting. In our case in the Battle of Jutland, this period was one of nearly 24 hours from the time the action commenced; therefore it is desirable that canvas and bamboo stretchers slung in tiers should be permanently arranged for this purpose. In our present Distributing Stations, twelve of these stretchers are kept slung in each compartment without unduly interfering with the usefulness of the stations for their primary purpose, that is as first dressing stations. It is recommended that at least thirty more of these stretchers should be slung when preparing for "immediate action" in other well protected compartments, the necessary hooks &c. being already fixed there permanently, and the requisite wire roping and stretchers kept always available in the Distributing Stations in the Medical Officer's charge; also that hooks for wire slings should be arranged

for [illegible] hold in the [illegible] mess [illegible] Here [illegible] after the [illegible] although [illegible] probably [illegible] not use the [illegible] it may be expected that there will [illegible] large spaces or flats which can be utilized after [illegible] will be enough room to stow all the wounded [illegible] on the deck.

Unfortunately [illegible] very bad indeed the rolling of a ship of this [illegible] the injured might be less disturbed by it than [illegible] is further wounded above or below them, if [illegible] if our own wounded, especially those suffering [illegible] were terribly restless, and I feel sure they were [illegible] comfortable [illegible] in beds on the deck than they would have been on narrow [illegible] while it might have been necessary to have kept many strapped in to prevent them falling out of the stretchers. In the [illegible] smaller ships, where there is no possibility of obtaining any space large enough to accommodate the wounded on the decks the [illegible] system is, of course, most valuable and in any case should be arranged for in as many places as possible because no one can foresee what will be the after conditions in a ship badly damaged in action. Even in the largest battleship the [illegible] system should be used until all danger of further fighting is over, as the wounded must be accommodated in the best protected places available and these are comparatively small compartments.

(6.) Another point which has been noted for future guidance is that it is not advisable that any of the wounded sent to hospital should return to the ship after recovering from their injuries. In this ship they were especially applied for because of their splendid behaviour after they were wounded and their own earnest wish to return to the ship; but, as has been mentioned previously, several of those who did return although not severely wounded showed markedly nervous symptoms afterwards, which possibly would not have occurred if they had been sent to other ships with entirely fresh surroundings.

SOMALI WARFARE: TWO LANDINGS AT LAS KHORAI

By Staff Surgeon [illegible] M'Cowen, M.D.

The following medical report on the two landings at Las Khorai in British Somaliland on May 10 and 14 may be [illegible] interest in giving one an insight into the features of most Somali fighting, and especially where the Dervishes are concerned.

On May 9, H.M.S. —— was suddenly detailed to go to Las Khorai, as news was received that the Dervishes had made a raid on the Warsangali tribe with the intention if possible of completely annihilating them and securing the port of Las Khorai.

We arrived at Las Khorai at 8 a.m. on May 10 and found the town in disorder. Several natives swam off to the ship and informed the captain that the Mad Mullah's tribesmen on sighting the ship were retreating. It was ascertained that the Darvishes, numbering about 2,500, attacked Las Khorai in the evening of May 6, descending on the town from the hills to the westward and gradually surrounded the Warsangali forces of 1,200. The western part of the town was immediately captured by the enemy and about 300 women and children murdered, and up to our arrival on May 10 intermittent fighting had been going on.

H.M.S. —— opened fire on the retreating Dervishes, accounting for, as it was afterwards ascertained, considerably over 300 (excluding the wounded who were carried away by their own tribesmen).

At 10.45 a.m. I landed with an armed party from the ship to attend to the wounded. From the number of dead bodies seen strewn around on the beach from the ship and from the results of the fighting ascertained from the Warsangali men who swam out from shore, it did not take long to decide to take enough dressings, &c., for a large number of wounded. I got a field chest in quarter and completely turned it out, refilling it with sufficient gauze, lint, cotton wool and bandages to dress 200 cases. Besides this, a large bottle of iodine, a surgical pocket-case of instruments, silk sutures, perchloride tablets, bowls, stretchers, and a bucket of water from the boat containing the landing party, and sufficient bearers were landed. It was afterwards found that this supply, although sufficient, was not in excess, as practically all the cases, as will be seen, were multiple wounds, some requiring as many as four and five dressings and bandages.

On landing we were met by hundreds of natives in a somewhat

exceptable condition but this was not to be wondered at, considering that they had been for four days fighting against superior numbers even up to the minute of our arrival Some had been without water for days, as the Dervishes after capturing the western part of the town held up the only water well, so that any Warsangali who tried at night to steal out from cover to get water had to run a very severe blockade with few chances of getting back again A number lost their lives in this way, but when one has to be without water under these climatic conditions especially after fighting in the blazing sun as these men had done all day there is no option but to run the gauntlet Some had almost succeeded and were actually drawing water when shot Their bodies invariably fell near the well and in the morning when first landing I visited the well on my way to attend to the wounded and near by could be seen three horribly bloated bodies which had just been fished out and had probably been in for days nevertheless the natives surrounded the well almost fighting amongst themselves in their eagerness to obtain some of the foul and polluted water

The smell on landing was very penetrating, which was not to be wondered at considering that the dead on both sides had been left lying about in all directions and the majority had been there for three or four days

The condition of the wounded was pitiful men women and children with all sorts and conditions of wounds had been left entirely neglected and many wounded and tortured women and children thrown outside their huts presumably to die

The wounded as Captain —— describes it, "appear to the Somali mind of negligible importance Certainly no help whatsoever is rendered given to them by their own relatives or tribe It was difficult at first to ascertain where the majority of the wounded were and it is even more difficult to try and get the Warsangali to bring their less serious wounded to a selected spot in order to deal with the cases more quickly The town is divided into an eastern and western part with a large space between in which is the Sultan's residence and in the vicinity of which are a number of huts

After having treated all the wounded brought to the selected rendezvous each part of the town was visited in turn and all wounded in huts and those lying about outside were attended to

Between 11 a m and 4 p m there were approximately sixty cases attended to The nature of the wounds were bullet and stab wounds and almost every conceivable variety of these two was to

be seen. There were a few recently inflicted clean wounds but nearly all those of three or four days standing had become septic. There was no pretence on the part of the natives to treat the wounds, with the exception of a couple of compound septic fractures of the leg and thigh which had been put up too tightly in improvised splints and were on the verge of becoming gangrenous. These splints were also blocking any exit for a very foul discharge. All these were removed and the fractures properly attended to and put up in proper splints.

Before going into detail as to the nature of the wounds, it is necessary to say a few words regarding the nature of the weapons. The Somali has three weapons of warfare: (1) the rifle which is of two kinds: (a) the old .303 British, Lee Enfield carbine and (b) by far in the majority the French "Le Gras," whose bullet is of solid lead approaching .44 size and so differing from the .303 which is of nickel with a lead core; (2) the other weapons are the spear or "hurba" which is about 5 ft. in length and (3) the knife or "jambia" about a foot long which is strapped to the side. The Somali fights at close quarters and is all are not supplied with rifles, some having only spears and knives, the object is to kill an opponent with a rifle and seize his rifle and ammunition, to one of the spearmen who then casts his "hurba" aside for the more useful weapon.

The larger number of cases consisted of stab wounds which were gaping about 3 or 4 in. long and varying in depth in the part of the body where they were inflicted. They were invariably multiple in each person and commonest over the back, head and chest. As a few examples of some of these latter wounds there was one woman with fourteen stab wounds of the back, the majority penetrating into the lungs from which exuded frothy blood. On the same person there were also multiple wounds of the head and arms and nearly all the tendons at the left wrist had been completely severed. All the wounds were septic and clogged with sand. This woman was one of the two cases who eventually died. Another example was a pitiful case of a young girl thrown outside a hut to die and whom apparently everybody refused to look after, as was the case in most of those seriously wounded. She had multiple stab wounds (about fifteen) of the back, head, breasts, limbs and face (the left eye being nearly removed by one stab wound) and also a compound septic fracture of the lower end of the femur penetrating into the knee joint, the latter being the result of a bullet wound. She was lying face downwards and all wounds were

in direct contrast [illegible]
as in most other [illegible]
One would have thought that [illegible] would have been satisfied after [illegible] cowardly blows especially on women and young children but this is not the case, and the slaughter of women and children is unfortunately an unhappy feature of most Somali fighting and an invariable occurrence where the Dervishes are concerned

In regard to bullet wounds all manner and sorts were to be seen of the chest, face head abdomen and limbs The majority of those of three or four days standing had become septic Some examples were as follows One old man who had walked a quarter of a mile to have his wounds seen to had the floor of his mouth and his whole lower jaw (in front of the angles) completely shot away the tongue was also badly shattered and torn A considerable time was spent over this case, cleaning him up, paring off useless pieces of tissue and making the condition look respectable but when seen again later on in the day he had removed his dressings presumably to try and eat some food, and had to be redressed I did not see this old man again as when we revisited Las Khorai four days later it was ascertained that he had gone to the bush to another village, probably for a change of air (?) or to consult his native man The native methods of treating wounds are somewhat primeval and not a little drastic The common method is to get a lump of fat tied to a piece of string heat it till it begins to run and then suspend it over the wound

There were other cases where the bullet had passed completely through the chest and the patients seemed to be fairly comfortable Again there were two cases where the bullet had hit the pelvic brim, fracturing this and lodging inside the abdomen In neither of these two cases were there any signs of peritonitis, although in both instances the injury had been sustained four days before being seen by me Compound fractures were fairly common and there were numerous cases of the bullets having passed through the fleshy parts of limbs missing the bones by fractions of an inch It was an extraordinary sight to see some of these people walking about, some with multiple bad stab wounds and others with gunshot wounds the majority being septic but apparently these people do not consider themselves incapacitated unless they are unable to walk One did not see in many cases the vast difference between the entrance and exit wounds one reads about in the medical journals in regard to the wounds sustained in France and other

theatres of [illegible] This may have been because of the close range in fighting. The "Le Gras" wounds could [illegible] be picked out from those caused by the 303 "Lee-Enfield" on account of their naturally larger size, but even here there was no marked difference between the entrance and exit. The majority of those which had lodged "inside" and had not gone through were the "Le Gras."

No wounds in which there was even the slightest possible doubt of sepsis were sutured. The majority of the cases were thoroughly cleaned up with perchloride dried and then painted with abundance of iodine and dressed with cyanide gauze and cotton wool, and when seen again these wounds were in a much better condition than if they had been made into a pus poultice by the aid of dressings containing protective tissue. Wounds requiring longer attention were the compound fractures which always take some time to put up properly.

The ship left at 7 o'clock that night on other duties, but returned again to Las Khorai on May 14, when I again visited the wounded. In the meanwhile the Warsangali tribe had been immune from any further attack from the Dervishes. This time on landing, twenty fresh cases were seen who had returned to the village from its immediate vicinity after the arrival of the ship. This made approximately eighty cases treated the result of the Dervishes' raid, and nearly all the sixty previously attended to were redressed. All the wounded, with the exception of two very serious cases who had died in the meanwhile, were found to be progressing favourably. Many of the fresh cases were like those previously seen, namely, gunshot and stab wounds, a number being of a serious nature. All the cases were attended to and a large quantity of dressings was left with the Sultan; instructions were given as to their use, and everything to ensure the comfort of the wounded was done. The ship left Las Khorai that afternoon.

One thing impressed me greatly, and that was the way the wounded took their misfortunes. I did not hear a single moan from any patient, and considering the nature of some of their wounds their fortitude was wonderful. A Somali loves a fight, and when hit never seems to bemoan his fate.

Two wounded captured Dervish prisoners were brought on board for further treatment. One of these cases had a septic compound fracture of the left thigh and septic bullet wounds of the right thigh. The other had a septic gunshot wound of the ankle joint with fracture of some of the tarsal bones. Both of these cases the next

[illegible] operated upon on board under a general anæsthetic all [illegible] wounds were thoroughly [illegible] and through-and-through [illegible] established. These cases still remain on board and are progressing favourably. With regard to the septic compound fracture of the thigh a Thomas's knee splint, as advised by Robert Jones and described by him in the *British Medical Journal* of January 16 1915, was applied in this case. This is an excellent splint giving access to the wound without disturbing the fracture or causing the patient any discomfort. It can easily be made on board in a short time by the surgeon and does not require any elaborate extension apparatus.

INTRASPINAL ANALGESIA

By Lieut Surgeon A. W. B. Livesay, M.B., F.R.C.S.I., R.N.

I adopted the intraspinal method of anæsthesia at the R.N. Hospital at the Cape immediately after the staff was reduced from three medical officers to two nine months before war broke out. Like all others who have given this method a fair trial we were so struck with its convenience and simplicity that we continued to use it when a year later the medical staff was again increased to three.

I followed the method as taught by McGavin at the London Post graduate School of Medicine, Greenwich. The analgesic used was stovaine billon which is made up in ampoules, 1 c.c. of the solution containing equal parts of stovaine and glucose, ½ cg. of each. The glucose is added to increase the weight of the solution, so that it flows by gravity to the most dependent part of the spinal canal when the patient is in the prone position. A special record syringe, made by Messrs. Allen and Hanbury is used. It should have half a dozen spare needles. The needles are of soft steel. The usual dose required is 6 cg. of stovaine. The syringe is divided off so that each division equals 1 cg. of stovaine. I have tried tropacocaine but found it not so reliable and the analgesia is shorter. On the other hand subsequent headache is rather less. The patient is prepared in the ordinary way but may have a light breakfast. The lumbar region is painted with iodine and a sterile dressing put on. The puncture is made between the second and third lumbar vertebræ or between the third and fourth—it does not matter which—both are well below the cord. The patient lies on his side, the side on which the operation is to be. If a double hernia is to be done the side uppermost should be first operated upon as analgesia will last longer on the lower side. He should be curled up until his chin nearly touches his knees and warned to keep still. It is important to see that he is lying quite square.

Now with the left forefinger of the gloved hand feel for the interval between the two spines. With the finger nail make a pressure mark in the skin just below the upper spine. We found the needle goes in more easily thus than by taking a spot midway between the two spines. McGavin says "Go neither up nor down neither to the right nor left." We found this far the best way.

The skin is now frozen with the ethyl chloride spray in a hare lip pin is thrust in to a depth of about 1 in This punctures the skin and makes a tract for the soft pointed needle to follow easily Next the needle with stylet, is pushed steadily in At a depth of from 2½ to 2¾ in it is felt distinctly and sometimes heard to puncture the theca On withdrawing the stylet, cerebro-spinal fluid flows

We used to allow the fluid to flow while the syringe was being filled but later came to the conclusion that the less cerebro spinal fluid escaped the less headache there was subsequently

The stylet, therefore, is put back the syringe is filled and the cannula is attached with a screwing movement Then the stylet is withdrawn the cannula introduced and the piston steadily pushed home

The patient is told to take two long deep breaths Just before the end of the second one the needle cannula and syringe are all withdrawn together The puncture is dressed with collodion He is now rolled over very gently on his back

The hips are raised by a board pidded with a towel to 1 in in thickness and the head and shoulders are raised by three or four pillows The lower dorsal region thus becomes the most dependent part of the spinal canal and the stovaine gravitates there

A screen is rigged shutting off the operation area from the patient s view

Analgesia is usually complete from one minute to two minutes after the injection If the analgesia lags the foot of the table should be raised for a few seconds and at the same time a patient should be instructed to take a deep breath In any man under 30 it is usually very easy to get the needle into the theca provided the patient keeps still In a very fat patient the spines are not so easily felt, and in older men there may be bony changes in the spine causing difficulty If the needle is felt to impinge on bone it should not be pushed on, this will only turn the point of the soft needle The needle should be withdrawn a little and then gently pushed in again slightly altering its direction upwards to the right or to the left If there is still failure the patient is probably shifted his position or is not curled up enough It is better now to withdraw the needle and start again in another place Once cerebro spinal fluid flows analgesia in my experience never fails provided the stovaine is all right We had a few failures due to a faulty box of ampoules If, by the depth it is thought that the needle must be in the theca, but no cerebro spinal

fluid flows [illegible] the patient take a deep breath and hold it this may cause it to flow If it still fails to flow, withdraw the needle slightly as it may be impinging on the theca on the further side, or turn it round, as the orifice of the needle may be against the theca

McGavin says that if a dose has been injected and there is no analgesia, the stovaine cannot be in the spinal canal and the dose may be repeated, as the stovaine if not under the theca cannot do any harm We had only one complete failure to get into the spinal canal This was in a very excitable junior officer who would not keep still Analgesia extends up to the umbilicus and lasts a full hour

The following is a list of operations performed under stovaine at the R N Hospital at the Cape from November, 1913, to April, 1915 —

Circumcision	13	Removal of bone plate	1
Papillomata excised	4	Bubo	—
Cysts excised	2	Bursa excised	1
Varicocele	7	Fistula	3
Appendicectomy	2	Amputation toes	2
Varicose veins	18	Excision semilunar cartilage	1
Haemorrhoids (ligature excision)	29	Hydrocele of cord	1
Hernia (radical cure)	27		

Disadvantages

In discussing the disadvantages of this method I may say that the only real one we experienced was headache About half the cases get more or less headache for twenty-four hours afterwards About one case in ten gets very severe headache for forty eight hours The less the patient moves while on the table and for some hours after getting back to bed the better He should be very carefully carried from the theatre and put on his back in bed with pillows under the head and shoulders Phenacetine and caffeine give some relief and an injection of morphia gr ¼ is given at night in all cases

In spite of this headache all patients we operated upon who had had a previous experience of general anæsthesia said that they greatly preferred the local method After the first few cases, men from ships on the station accepted it quite readily Patients from strange ships were apt to shy off a little at first but when put in a ward with a man who had had intraspinal analgesia there was no further difficulty In one case in which the needle must have hit off a strand of the cauda equina there were severe shooting pains down the legs for five days

McGrigor [illegible] of two thousand cases has [illegible] case of paralysis. About one patient in ten gets slightly [illegible] perhaps vomiting during the [illegible] of the operation. One case [illegible] lower the head of the table [illegible], but a little brandy usually [illegible] things right [illegible]. It is haunting I am convinced is purely psychic [illegible] surroundings, smell of antiseptics &c. I did not [illegible] stovaine very early in the series and was [illegible] because the patient happened to get faint just when the [illegible] was being pulled upon. I did another two [illegible] on this occasion the patient got [illegible] fainting [illegible] was opened. In this case there was [illegible] difficulty in locating and removing the appendix as it was [illegible] running up in the direction of the liver. The patient complained [illegible] some pain when the operator's hand was above the umbilicus [illegible] the necessary manipulation very well. A sick berth steward [illegible] told off to talk to the patient and reassure him.

ADVANTAGES.

The greatest advantage is that with stovaine *two* medical officers are sufficient for all ordinary operations, and at a pinch *one* can do quite well single handed. This is a great boon in hospitals with a small staff, especially now days when blood examinations for instance may keep one medical officer busy for the whole day.

It is economical. The cost of stovaine costs sixpence against twelve shillings for the average chloroform in open ether administration. This difference is greatly increased in warm climates. The initial cost of the syringe is thus very soon made up. In certain operations it has very definite advantages. Thus in hernia, should there be any difficulty in finding the sac, or should the presence of a second sac be suspected, by telling the patient to cough the sac is at once revealed. It is of special value in operations for haemorrhoids and fissure and fistula as, owing to the perfect relaxation of the sphincter, stretching the muscle is seldom necessary. Suturing the abdominal wall is much easier than under a general anæsthetic, owing to the rectus being absolutely slack. In tedious operations such as varicose veins of both legs, requiring multiple excisions and double Trendelenburg, with only two medical officers available both legs can be operated upon at once, thus halving the time the patient has to lie on the table.

For the service at all at under present war conditions I do not consider that spinal analgesia would be of much value. It is hardly suitable for dealing with such a rush of operation cases as may have

[illegible] injection In [illegible] I [illegible] that [illegible] great benefit if a spinal [illegible] supplied [illegible]

A medical officer single handed confronted with an operation for acute appendicitis or strangulated hernia, by using stovaine would be able to dismiss from his mind all anxiety about the anæsthetic and could concentrate the whole of his attention upon the operation

For obvious reasons no operations but those of the greatest urgency are done on board our ships in war time But in peace time there are certain operations which could very well be done on board what I may call 'quick cure' operations, those which have a comparatively short convalescence Under this heading might be included, I think, circumcision, simple cases of varicose veins varicocele fistula hæmorrhoids hernia etc &c

Large ships are now provided with operating theatres and I hope that, some day these will be used In my present ship there is a most perfectly equipped and lighted little theatre in which as regards asepsis and convenience one could tackle any operation with confidence

Under intraspinal analgesia, operations of the class I have indicated could be perfectly well performed by the ordinary medical staff and this I hold with a fourfold advantage to our Naval Medical Service In the first place it would be excellent practice for the operator who would rapidly develop technical skill and confidence Secondly, the fact of doing real surgical work on board ship even with an operation perhaps only once a fortnight would I am convinced do a great deal to promote the keenness of junior medical officers on first going to sea Thirdly, the sick berth staff on board would greatly benefit They would have wider opportunities of becoming proficient, in preparing patients for operation, in theatre routine and in the after care of operation cases This would result, I am confident, in a general increase of efficiency all round Fourthly the operating surgeons in our big hospitals would be relieved of a great amount of what is to them routine operating work and would have greater time to devote to their more serious cases There would be a considerable saving to the State not only in the time taken up in these patients going to and from hospital but also, in many cases the cost of their transit

I have to thank Deet Surgeon A J Hewitt and Staff Surgeon G T Verry for the enthusiasm with which they took up the intraspinal method, and for the skill with which they did many of the injections

ON VENEREAL SORES WITHOUT GENERALIZED LESIONS

BY SHELDON F. DUDLEY, M.D., R.N.
Royal Naval Hospital, Chatham

THERE is little that is new in this paper, and the observations in it merely confirm those of more experienced observers, but being a would-be pathologist as well as a clinician, I think it presents a very real problem from a more practical point of view and summarises in a short space a large amount of modern teaching on the subject.

A sufficient excuse for writing this article is found in the one fact that at present only a quarter of the cases of syphilis in the Navy start arsenical and mercury treatment before secondary lesions appear. Since the discovery of the *Treponema pallidum* in 1905 and the application of the complement fixation reaction to syphilis by Wassermann in 1907, we can be certain of the diagnosis of syphilis without awaiting for secondary signs to develop. With the introduction of salvarsan in 1909 we obtained the means of preventing the occurrence of secondary symptoms and rendering a patient non-infectious in a few hours, neither of which could be done at all or very seldom by the use of mercury alone.

Practically all medical men now admit that the right time to begin treatment is as early as possible in the primary stage. Briefly, the reasons are: (1) The patient is more certainly and quickly cured, and the disease is less likely to recur or cause permanent injury to the constitution if it is not allowed to proceed to the generalized secondary stage, during which the spirochætes have more chance of colonising. This is especially the case with regard to the central nervous system, where once established they are often impossible to eradicate and may lie dormant for years.

(2) The sooner a man receives a dose of salvarsan or its substitutes, the shorter time is he a danger of infection to his messmates or the social community at large. One injection of these arsenical compounds causes complete disappearance of the treponemata from the lesions in a few hours. I have never been able to find spirochætes (in sores which previously swarmed with them) on the day following an injection of galyl or neosalvarsan. The lesions therefore no longer contain the wherewithal to spread infection, and I believe this not only because of one's inability even to

and specific [illegible] injection but also because in nearly all cases the [illegible] to heal and the man gets apparently cured by one dose [illegible] It was for this reason that at first after the introduction of salvarsan it was thought that one injection absolutely cured syphilis Unfortunately in most cases a few organisms apparently survive and remain inactive for varying lengths of time so no reliance can be placed on one or two doses of these salvarsan compounds causing a permanent cure A case that illustrates this is that of a man who had primary syphilis to whom I gave one injection of neosalvarsan in April 1915 by some means or other he escaped all further treatment going through the Cameroons campaign remaining free from all signs of the disease until August, 1916 when he developed a syphilitic ulcerated throat, and reappeared at Chatham hospital for treatment

(3) From the Service point of view, if men are treated before secondary signs show themselves many days' sickness are saved, and sounder and fitter men preserved for the Navy In 1913 there were 719 primary cases and 2 183 secondary cases of syphilis in the Navy the primary cases averaged 21 7 days sickness each and the secondary ones 34 3 days roughly 10 days more than a primary case It may be justly concluded on these figures that if the secondary cases had been diagnosed and treated with salvarsan or its substitutes in the primary stage even under the existing routine 21 330 days would have been saved the Service, as these drugs invariably abort the secondary stage Personally I believe a primary case is much better for carrying on full duty, and also if he has galyl I believe it necessary to retain him on the list for the day of injection only thus with three galyl injections the ordinary case of syphilis under ideal conditions would only be 3 days sick instead of 30 or more as at present And in addition for reasons given above there would be no need to segregate him as once having had his galyl injection he is no longer a source of danger to others

In spite of the fact that these views are now almost universally accepted in 1913 only 24 8 per cent of syphilis cases started treatment in the primary stage and during the quarter April to July 1916 only 26 5 per cent of 302 fresh cases of syphilis admitted to Chatham hospital were without secondary lesions What is the reason for this low percentage of primary cases treated? Many men, of course, conceal venereal disease till the secondary symptoms are evident, and this at present is especially common with the Reserve and Temporary ratings now in the Service These latter now

[illegible] with the syphilis [illegible] treated at this hospital (402 out of 702 cases admitted recently were of this class) but I do not think concealment accounts for most of the cases which get past the primary stage The waiting for secondary signs to appear was the universal teaching till latter years the disease thus diagnosed itself and saved the doctors trouble This custom dies hard and is responsible for a lot of secondary cases which might have been treated earlier It is an especially pernicious doctrine as it may happen that the secondary signs do not appear at all or not for years, and thus cases may get no antisyphilitic treatment of any kind till it is too late In most places it is still routine to wrap up every sore in lotio nigra or antiseptic before diagnosis is confirmed, thus minimizing the chance of finding spirochetes and of proving a sore syphilitic at the ideal time to start treatment, that is before the Wassermann reaction becomes positive It also accounts for the terribly common history of a man being discharged as a cured "chancroid" and returning a week or two later as a "syphilis secondary"

It was the great discrepancy between practice and theory that led me, last November to wonder if laboratory methods were as much use as one thought as an aid to diagnosis Since then every venereal sore that could be got hold of was examined, both for *T pallidum* and by Wassermann's reaction The majority of sores were only examined once and the search for spirochetes was generally hurried as a minute or so of time was all that could be given to a slide Though I have found the spirochetes of syphilis in lesions in which they were not numerous after half an hour's search usually, if present, they are easy to find In addition most of the sores had had some antiseptic treatment before examination though by the courtesy of medical officers in the port they were nearly always put on saline dressings on arrival in Chatham yet under anything but ideal conditions the investigations showed that nearly all syphilitic sores could be definitely proved to be such, either by finding spirochaetes or by the Wassermann test Some of the cases were examined two or more times, but only first examinations are included in this first table of statistics Altogether the venereal sores of 671 men who had no signs of secondary syphilis or history of previous syphilis, were examined 426 or 63 42 per cent of these were at once proved to be syphilitic by one or other test the remaining 245 gave a negative result to both tests The first thing to do is to try and see how many of these 245 were probably syphilitic, 115 of

[illegible] negatives were examined up [illegible] 15 1916 [illegible] [illegible] at least to have elapsed [illegible] development [illegible] secondary symptoms On the date of writing August 10 [illegible] 16 of these 11 [illegible] or 13 9 per cent, have been proved to be syphilis either by subsequent tests or the appearance of generalized lesions I do not think many more than this were syphilis as cases of venereal disease remain in the port until cured and anyhow were nearly certain to have drifted back to hospital for treatment even if symptoms had developed after drafting still to be well on the safe side call the 13 9 per cent 20 per cent Therefore of the total 24 cases to give a double negative on the first examination presumably less than 20 per cent, that is, 49 were syphilitic therefore out of the 671 cases, 126 were certainly syphilis, 49 probably syphilis and 196 probably chancroid

Before going further it is as well to point out this is no evidence of the relative prevalence of the two diseases

The Annual Statistical Report of the Health of the Navy shows the ratio of chancroid to syphilis to be about 2 to 3 The reason that syphilis preponderates to such an extent in these figures is probably because cases suspected to be syphilis are sent from many places to Chatham for arsenical treatment while those thought to be chancroids are treated locally

The results of the first examinations of these 471 cases considered to be primary syphilis may be divided thus —

		Number	Percentage
Class A	Spirochaetes found, but Wassermann negative	135	28 6
B	, and positive	179	37 9
C	, not seen	151	31 8
D	Both tests negative (but probably syphilis)	46	10 6
		471	100 0

Thus in A and B we have the number in which Spirochaetes are seen viz 67 9 per cent
B and C , Wassermann is positive viz 61 1

Therefore by means of either test alone one can be certain of over half the syphilitic sores and with the use of both tests 90 per cent of primary sores reveal their nature Of the remaining 10 per cent, nearly all could be proved syphilis, before secondary symptoms appeared if repeated examinations are carried out It is in the early days of the primary lesion when the Wassermann reaction is generally negative that the *T. pallidum* is most easily found and this is the ideal time to start treatment before the blood reaction appears The reason why they are easy to demonstrate in sores of short duration is twofold first the case is less likely to have had much local treatment secondly all syphilitic lesions tend towards local cure

[illegible] a sore will heal up without [illegible] immunity to the treponema; therefore in late sores, the spirochaetes may have disappeared before the time of examination.

In most cases a note was kept of the date of infection and appearance of the sore. Those dates are not very trustworthy as they depend on the word and memory of the patient, and the men treated have often a very vague idea of time. Also however truthful a man is ordinarily, he will for no obvious reason lie about his venereal disease. For example over and over again men deny sexual intercourse at all and numbers will say that a given date of infection, which seems unlikely to be the right one, is the only time they had ever had connection, a statement too common to be always true. Again a man will frequently say a rash or bubo appeared before the penile sore, occasionally he may think he is telling the truth, as the more noticeable late conditions may have attracted his attention to an insignificant primary lesion. Men too almost invariably tend to give a shorter duration than the actual, to avoid being blamed for concealing disease. Still, in spite of these sources of error, a study of the duration and incubation periods of these cases gives some interesting results. 209 men of the syphilis group in which a note was kept gave a more or less definite date of infection and appearance of the sore from these dates this table is compiled:—

TABLE I.

Duration of disease	Total.	Wassermann positive.	Wassermann negative.	Percentage spirochaetes positive.	Percentage Wassermann positive.
Under 10 days	77	63	33	80.5	42.8
Between 10 and 20 days	69	42	62	68.7	45.4
20 " 30 "	23	17	20	85.2	86.9
30 " 40 "	26	8	24	92.3	30.0
Over 40 days	15	8	15	66.3	100.0
Totals	209	135	144	14.4	63.1

The correlation of the two tests, how that if one is negative the other is likely to be positive, is well shown by the table but the diagram compiled from the percentages in the table shows this more forcibly still.

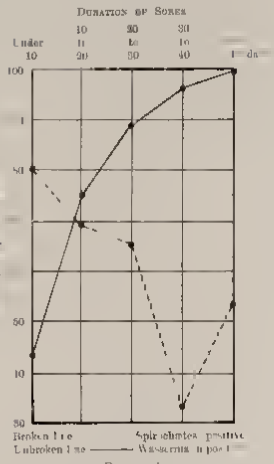


Diagram 1

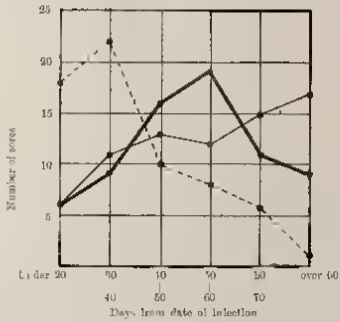
It will be seen that the percentages of sores with demonstrable spirochetes drop steadily till the oldest sores of over forty days duration is reached when it rises again. This rise may be only a chance owing to luck in finding spirochetes more often than would have been the case if a larger number of sores of this class had been examined. There is another possible explanation: the average duration of the primary stage is forty two days, so one would not expect as many pure syphilitic infections (without secondary signs) as fifteen in the over forty days group. It was noticed that many of these sores of long duration gave short incubation periods; therefore it is quite possible they were mixed infections and the real duration of the syphilitic element may have been nearer twenty than forty days.

In the next diagram based on the date of infection instead of

appearance, it will be seen this terminal use does not occur in the spirochæte line, as the error introduced by mixed infections cannot come in For this reason and because men have less cause to be about at the date of contracting the sore is perhaps more reliable so another table and diagram is shown of the same 209 cases this time dividing them into three classes (1) Both tests positive (2) spirochætes only (3) Wassermann only positive the time being reckoned from the date of infection

TABLE II

Time from date of contraction to examination	Wassermann and spirochæte positive	Spirochætes only positive	Wassermann only positive	Total
Under 20 days	6	18	1	25
20 to 30 days	9	22	11	42
30 40	16	10	11	39
41 50	19	8	13	39
51 60	11	6	15	32
Over 60 days	8	1	18	27
Totals	70	65	74	209



Thick line ——— Both Spirochætes and Wassermann positive
Thin line Wassermann only positive
Broken line Spirochætes only positive

DIAGRAM 2

It w[illegible] the totals of sores in each [illegible] period [illegible] very much, so in making the diagram [illegible] unnecessary to reduce the numbers to percentag[illegible] would be easier to understand if the figures wo[illegible] as they stand

Before leaving these statistics it is as well t[illegible] they agree with those of other observers In Table I the figures of positive Wassermann reactions at various times in the primary stage are all a little too high in that the actual duration of the sore is nearly always longer than the admitted duration in the class of case treated in the Navy, also I have made no allowance for the double negatives The number of primary cases to give a positive Wassermann reaction varies greatly in different reports because it depends entirely whether the majority of reactions were done late or early in the primary stage Therefore, the percentages of positive reactions in primary syphilis are of little value unless the age of the lesions is stated Gring one of the latest observers to publish his results gives 44 per cent positive at end of the first week, 57 per cent at end of second week and 76 per cent at end of fourth week His figures for secondary syphilis are 96 per cent positive Fleet Surgeon Bassett-Smith's figures 93 per cent, and my own on the secondary cases I examined and treated myself 90 5 per cent positive These figures balance pretty well with mine The antigen used at Chatham was perhaps less sensitive than theirs Until three months ago guinea-pigs heart and cholesterine were used Now human heart replaces the guinea pig and is more satisfactory and experimentally more sensitive than the older antigen Also, owing to receiving all sorts and conditions of blood from all over the country most of them unaccompanied by any data concerning the case they have been taken from I never return a reaction as positive unless hæmolysis is absolutely inhibited, or negative unless hæmolysis is complete and if hæmolysis is incomplete it is wiser to return the reaction doubtful, avoiding such terms as 'weak positive, and probably negative The reaction is a quantitative one therefore such terms mean little, and after all only cover 2 or 3 per cent of reactions which are not clean cut positives or negatives (These remarks are based on an experience of over 10 000 tests personally performed at Chatham)

If we turn now to the sixteen sores that were not proved syphilitic till after the first examination and tabulate them one is able to get an idea why some of them were missed

TABLE III

CASES GIVEN A NEGATIVE TO ROUTE TESTS ON FIRST EXAMINATION

Case	Date of positive examination	Incubation	Duration	Number of sores	Treatment	Examined again	Has proved syphilis	Date proved syphilis
1	25 12 15	?	?	Circumcision wound	Lot. nigra	No	Secondary rash Wassermann positive	10 1 16
2	28 11 15	11	21	Single	,	[illegible]	Secondary rash Wassermann positive	23 12 15
3	[illegible] 16	12	11	?	Saline	,	Secondary rash Wassermann positive	16 3 16
4	1 3 16	8	21	?	Lot. nigra		Secondary rash Wassermann positive	17 4 16
5	1 1	6	10	Multiple		Yes 16 3 16	Secondary rash Wassermann positive	11 4 16
6	1 16	34	6	Single		Yes	Secondary rash and Wassermann always negative	10 6 16
7	1 1	14	5	Multiple	Iodoform		Tubercle present	16 12 15
8	8 3 16	[illegible]	16		Saline		positive	15 3 16
9	1 16	3	11	Single	Lot. nigra		,	27 4 16
10	1 1	11	8	Multiple			,	26 4 16
11	1 1	14	11		Saline		Wassermann positive	10 1 16
12	1 1	8	10		Lot. nigra			7 2 16
13	18 4 16	18	9		Exposed to infection in April positive		Wassermann No secondary signs	19 5 16
14	1 1	8	2	Multiple	Saline	Yes	Wassermann positive	12 6 16
15	1 1		7		Lot. nigra			12 6 16
16	11 1 11		3		Saline		,	3 7 16

On looking through the table it will be seen that only six got as far as the secondary stage, and only two of these cases 5 and 6 were examined again before secondary signs developed. The remaining ten were proved to be syphilis, four by finding spirochaetes and six by the Wassermann reaction before generalized signs appeared. It will be seen that most cases had had local antiseptic treatment, which minimizes the chance of a successful spirochaete examination, though they have been demonstrated in sores which have been weeks on lotio nigra. Case 10 is an example of a sore which had been treated with lotio nigra up till the time of the negative first examination, on substituting saline dressings, spirochaetes were found at a later examination. It must be always kept in mind that a sore may not be syphilitic at the time of examination, chancroid and syphilis being caught at the same time and the sore being examined at a time before the syphilitic virus has incubated. Cases 5 and 16, were perhaps of this class. This class of mixed infections seems to be very common both from appearance of some sores, and the number of short incubation periods given by

[illegible] syphilis 18.2 per cent of the [illegible] of under ten days. The [illegible] was 21.9 days. Twenty [illegible] incubation period of syphilis [illegible] tend to run than it seem shorter and the tendency [illegible] post date the appearance of the chancre tends to [illegible] longer than the actual period. (N.B.—Ratings giving two possible incubation periods are not included amongst these 209 cases.) Case 6 is an example of a case where the Wassermann remained permanently negative and no treponemata could be found. The sore of Case 13 healed up, he exposed himself to infection again so it is a matter of doubt if he was syphilitic at all at the time of the first examination.

I have been told that spirochaetes mysteriously appear and disappear from syphilitic lesions from day to day, which may be another possible cause of missed sores. I have no evidence of this and think it must be exceptional in early untreated sores, but as explained above they tend to die out from old sores, and one may get a stage where they can sometimes be found and at other times cannot, but by this time the Wassermann reaction should have become positive in most cases.

This investigation brought out very strongly how impossible it is to diagnose most primary sores from their appearance. Text books lead one to put great faith in induration, also they give one the impression that the syphilitic primary lesion is rarely multiple. If a sore shows cartilage like induration it almost always proves to be syphilitic, but early sores more often than not show no induration. The typical Hunterian chancre and a pure Ducrey bacillus infection are characteristic, unfortunately the vast majority of sores are not typical nor are they pure infections. This is due chiefly to an invariable contamination with pyogenic and other organisms. It is seldom, therefore, that one can say with any certainty that a sore is a chancroid or a case of primary syphilis without having recourse to laboratory methods. During some time a note was made as to which infection the case was thought to be before the result of the spirochaete or Wassermann examination was known; this note was so often wrong that I soon decided it was a mere guess in most cases.

As regards the number of sores in each case, this was noted in 148 cases of undoubted syphilis and in 228 cases considered to have chancroids only. 14.1 or 17.6 per cent., of the syphilis cases had two or more sores, and 122, or 53.2 per cent., of the chancroid cases

had two [illegible] sores. From the tendency of [illegible] to be multiple [illegible] a little greater than that of syphilis [illegible] if not the slightest aid in diagnosis, over one third of the syphilitic chancres being multiple.

The position of the lesion on the genitals shows some relation, but very little, to the kind of infection. Sores on the skin, especially towards the root of the penis or on the scrotum, and also those which involve the meatus, are generally found to be syphilitic. The favourite site of election for chancroid seems to be the mucous surface of the prepuce. Whilst discussing position it does not seem out of place to make a short digression on extra genital sores. Hard induration is not characteristic of those I have seen, but painless œdema with painless enlargement of a neighbouring lymph gland is. Two or three have been diagnosed at Chatham before the onset of generalized symptoms. A septic place in a healthy blue rubber that will not respond to ordinary treatment is always worth a sprochæte and a Wassermann test. The following case illustrates this:—

In 1907 a boy came to the sick bay of H.M.S. Dragon with a septic bubo which could not be persuaded to heal; a diagnosis of syphilis was not dreamed of. Six weeks later he developed marked general lymphadenitis and a typical secondary rash. With our present day knowledge a sprochæte search or a Wassermann reaction would very likely have been made, and the real nature of the condition discovered before the appearance of the rash.

Extra genital sores in the neighbourhood of the genitals are not uncommon—I have seen them on the scrotum, lower abdomen, umbilicus, and thighs. These parts are likely to get contaminated by the infectious discharges of the woman, and the man could easily inoculate himself by scratching a scabies papule or in a like manner. A thought here strikes one very forcibly: men are sometimes accused of unnatural practices on the evidence of syphilitic infection in the region of the anus; itching in that neighbourhood is common, but how easy for a man innocent of criminal offence to infect himself in this region in the way just suggested; anal ulceration therefore appears very unreliable evidence in these cases.

The preceding paragraphs show how impossible it often is to be certain of the diagnosis of syphilis in the primary stage without having recourse to laboratory methods. Any lesion on the penis may be a primary sore, and I am convinced in some cases a sore may not exist at all. I have seen one or two cases of syphilis with a hard painless nodule in the course of the dorsal lymphatics of the

penis over which the skin [illegible] showed no signs of inflammation and other [illegible] with indurated inguinal glands In these cases there [illegible] a sore and no signs of a scar that might have [illegible] [illegible] suggests the following explanation that [illegible] owing to the tissue resistance in some other [illegible] develop at the site of entry but some of the spirochetes [illegible] and get as far as the lymphatics where they begin growing to form the initial focus The French have recognized this form of primary syphilis for a long time but it has not attracted much attention in this country I think however every one admits the secondary symptoms may be so mild as to escape attention what if both stages pass unnoticed more frequently than is generally believed? If so does it not offer a more plausible explanation, for the many cases of late syphilis and para syphilis that give no history, than the assumption that all these men are liars or have such appallingly bad memories That the lack of history is generally due to the wilful falsehood or bad memory is admitted but there are patients who readily confess the risk of infection or to have had gonorrhœa and who obviously seem to be doing their best to remember anything that might have been early syphilitic manifestations A reasonable solution to the lack of history in these cases is offered by this absence or insignificance of both the primary and secondary stages

Two or three conditions that lead to diagnostic errors should just be mentioned one is the tendency of late lesions to occur at the site of the primary lesion this fact alone explaining many of the so called second infections with syphilis other sources of error very common in the Navy and non venereal in nature are herpes scabies, and inflamed small sebaceous follicles Herpes unless seen early, is often very difficult to distinguish from soft sores, while scabies may deceive one by having its only obvious lesions on the penis

If this paper seems to extol laboratory methods at the expense of clinical observation a word of warning is necessary negative laboratory results should invariably be ignored in syphilis, as well as all other conditions if the clinical side of the case does not fit in with them Positive results if obtained with reasonable care are generally sufficient diagnostic evidence in themselves Secondary and tertiary lesions are generally pretty obvious clinically and the Wassermann a useful confirmatory sign which is better ignored if negative Early primary syphilis is seldom obvious clinically and here if we can get a positive laboratory result it is of the utmost

importance in arriving at a diagnosis of syphilis. The finding of the treponemata in serum from the sores is the most successful method in the first half of the primary stage, a positive Wassermann reaction in the latter half of primary and in latent syphilis, while clinical observation is the best diagnostic method in all other stages. Even in the primary stage, if the case is clinically syphilis, in spite of repeated negative laboratory results it should be treated as such. Syphilis and Wassermann are not synonymous terms though some use them as if they were. The following case shows what is meant.—

A man, aged about 20, was admitted to hospital in November, 1915. He had been infected in March and circumcised in April 1915. A large ulcerated penile sore the size of a florin with heaped up edges was present. Presumably because his Wassermann reaction had been fifteen times negative and several spirochaete examinations also negative, malignant disease was actually suggested as a diagnosis. He apparently had had no anti-syphilitic treatment in the eight months previous to admission to hospital and no secondary signs. The tests repeated at Chatham were negative but the sore healed up within a month of receiving a galyl injection. Incidentally, response to treatment is a well recognized though lately very neglected form of diagnosis since laboratory methods took its place.

Personally I am not certain, if one is in any doubt about the nature of a penile sore, whether it is not better to commence treatment rather than let a man run the risk of the awful consequences of infecting his central nervous system by waiting to confirm a diagnosis by generalized signs.

The question arises—is there any remedy for the small number of cases in the Navy treated in the primary stage? To repeat the chief causes, they are in their probable order of importance: (1) Not making full use of laboratory methods. (2) Concealment of disease for part or whole of the primary stage. (3) Delay and difficulties of getting cases to institutions where they can get intravenous injections of arsenical drugs. (4) The loss of time in the return of laboratory reports. If a case is seen directly the primary lesion appears there is an average of forty-two days available to make a diagnosis and start treatment, but of course a man may be seen so late in the primary stage that the time that has to elapse before confirming the diagnosis and getting him to hospital may be too long to save him from secondary symptoms.

To take full advantage of laboratory methods the following procedure is suggested: (1) Sores unless the local condition absolutely demands more energetic treatment should be dressed only with normal saline solution or warm water, and receive no antiseptic

[illegible] should [illegible] for [illegible] and if [illegible] weekly [illegible] healed or diagnosis [illegible] (3) Blood should [illegible] for a Wassermann [illegible] till positive or till the sore is healed (A negative Wassermann during the first three weeks of the sore means nothing—and it would be wise if the sore heals to repeat the test again a month later.) (4) Ignore laboratory negatives if clinically everything points to syphilis. *The spirochæte examinations if possible should be made on ship or man's place of duty. Dark ground illumination is by far the easiest quickest and most reliable method of demonstration, far better than any staining reactions and it would be well worth while providing a special lamp and dark-ground condenser to the surgeon afloat who uses microscopic outfit.*

Some medical men loathe the microscopic methods, for them except for delay in return of the report there is no reason why serum from a syphilitic lesion should not be sent in capillary tubes to the nearest laboratory. Treponemata will remain recognizable for two or three days after collection. The report on a blood sample for Wassermann may take ten days to obtain from the time of seeing the case because (unless at Chatham) it is only possible to do blood tests once a week the time taken in preparing and standardizing the materials necessary being considerable, and it takes as long to prepare for one test as for the 150 that are usual. This might possibly be arranged for by having different days at different laboratories and by sending the blood to the laboratory whose day for doing the tests best fitted with the arrival of the patient's blood by post. In this way a report might be obtained four days to a week earlier. The waiting for opportunities to send a man ashore for an intravenous injection and even then the waiting for vacancies—at times of rush at the hospital is a cause of very considerable delay. *The easiest remedy for this would be the giving of arsenical drugs afloat.* In galyl we have as far as can be seen an almost harmless drug with antisyphilitic properties, nearly if not quite as good as salvarsan, it is easy and simple to give, and if ever it is found practicable to give intravenous injections in a ship, it is the ideal drug for the purpose. (Nearly 1 000 injections of galyl have been given at Chatham without a case giving any cause for anxiety, and the dose in no case, except two or three at the start of its introduction, was less than 0·4 gramme.) The most difficult cause of the small number of primary cases of syphilis in the Navy to deal

[illegible] is concealment of [illegible] At [illegible] that is not so [illegible] amongst all [illegible] amongst reservists especially trawler ratings, who are not probably as used to and have not had the opportunity to bring their ailments to a doctor, or so well educated in the importance of reporting early when sick as the regular ratings. To combat concealment, I am certain punishment is of little use laying great stress in hygienic lectures on the importance of early treatment from the man's own point of view, how he has a better chance of permanent cure and less time on the sick list may have some effect Men should also be told how the most experienced doctor let alone a quack chemist or a messmate, is often unable to say any penile lesion is not syphilis this is necessary as there is a lot of quack practice in venereal disease in our big seaport towns There is room also for more humanity and consideration for venereal patients in the Navy one cannot help hearing many expressions of contempt and disgust concerning these unfortunates from people who have either been only lucky in escaping the disease themselves, or possessing the advantages of a better education and higher principles should surely have more pity for those who have not had these advantages No one knows better than the unfortunate man himself the moral stigma attaching to the syphilitic whereas rarely (why, I have never understood) is there any attached to the man who has risked it but been lucky enough not to get infected The only hope of lessening concealment is education for the men before, and consideration for them after contracting disease To summarize this paper tends to show —

(1) Only a quarter of cases of syphilis in the Service start intensive treatment in the primary stage

(2) That if seen in the primary stage over 90 per cent of primary cases are definitely diagnosable as syphilis

(3) The proportion of primary cases to start treatment might be increased by further use of laboratory methods and by doing everything possible to encourage men to report early

(4) The advantages that would be gained are thousands less of sick days, and sounder men saved to the Navy, by treatment with arsenical drugs on board time, paper work and transport would be economized, and many beds in hospitals would be released for other cases And what to my mind is more important than any of the above, a man would be rendered non infectious sooner and be for less time a danger of infection to the community at large thus reducing if only to a small extent, the actual incidence of

syphilis [illegible] and the whole country Men would be treated [illegible] when there is the best chance of preventing recurrence [illegible] in the central nervous system It is here that the [illegible] so difficult to eradicate having once colonised, and [illegible] mologists agree that it is most likely during the secondary [illegible] stage of syphilis that the seeds of future general [illegible] tabes ataxy are laid Therefore treatment in the primary stage seems our only hope of diminishing these scourges as there is little evidence that any amount of treatment later prevents their appearance In addition what is of especial importance at the present time, the birth rate would increase infant mortality decrease and more and healthier children be bred for the nation

In conclusion though the State cannot see its way to devise or introduce legislation to prevent syphilis in the community at large, yet in the Service the idealist can see the dawn of the day when all cases are diagnosed and start intensive treatment in the primary stage, no man is more than three days sick, and secondary syphilis a rare and strange condition almost unknown in the Royal Navy But even if the complete realization of this vision is impossible I hope anyone who has read through this paper will admit there is still a little room for improvement in the routine, control and treatment of syphilis in the Royal Navy

ADDENDA

The above paper was written in August 1916 except for bringing some of the figures in it up to date (November 1916) there is no need to alter any statements in it The following observations were made since the paper was written and are added to make it more complete

Two actual cases have been seen which show that the *Treponema pallidum* is often present in the early primary stage, while the Wassermann reaction is still negative, and that the treponemata have often disappeared by the time the Wassermann is positive

Case 1 —Two insignificant penile sores contracted seventeen days previously had been present for three days, Wassermann negative treponemata numerous Re examined twenty eight days later Wassermann positive no spirochaetes found in the almost healed sores which had only been treated with saline dressings

Case 2 —Sore present for fifteen days Wassermann negative *T pallidum* found sixteen days later no spirochaetes could be seen but Wassermann was positive

These two cases are the only two of this description I have records of as once diagnosed by either test a man should start treatment But owing to a report going astray or to some other error these cases were obtained The following figures collected during last quarter compare,

very roughly the delay in reporting disease with the delay in diagnosis and transport, as a cause of men developing generalized syphilis before receiving arsenical injections

In ninety-two unselected cases of early secondary syphilis a note was made of the time that elapsed between a man reporting to a naval medical officer and his appearance in hospital for arsenical injections The average number of days per case was 50 1 That is the average case of secondary syphilis had been under observation over seven weeks before he got an intravenous injection Allowing three weeks as the maximum time required for diagnosis and transport, it was found 57 6 per cent of these cases had been under observation over three weeks before getting an arsenical injection

In seventy secondary cases where a possible date of contracting the disease was given the number of days between this date and the date of reporting the disease was noted Sixty seven days is the average time that elapses between infection and the appearance of secondary signs, so if the above number is under sixty seven the man probably reported himself during the primary stage In 71 7 per cent of these cases this was the case If twenty one days (the maximum time allowed for diagnosis and transport) is taken from the number sixty seven we get forty six days so if a man reports within forty-six days of infection there should be plenty of time to diagnose and treat him before secondary signs appear this was the case in 51 4 per cent of these secondary cases These figures require no comment but it may be remarked in very few of these cases had any attempt been made at laboratory diagnosis during the primary stage

Many of the cases that had definitely arrived at the secondary stage before reporting sick admitted being treated privately ashore by a chemist or quack

I would like to make it quite clear that galyl or neosalvarsan given however late in the primary stage, almost invariably prevent the onset of generalized syphilis This power to abort the secondary stage is their most valuable property and is where they are especially superior to mercury alone All cases should of course have in addition at least two years intervenal treatment After the primary stage has passed, in the vast majority of cases as good results if not as rapid, can probably be obtained with mercury alone

This paper is largely statistical I wish to anticipate the obvious platitude "that statistics can be made to prove anything Because if anyone thinks a moment he will realize that all the so called "facts" of medical science are founded on statistics compiled from large numbers of cases If the figures used in this paper have been wrongly applied or important factors not allowed for I will be grateful to anyone who will point out the errors

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A REVIEW OF THE TREATMENT [illegible] GONORRHŒA

[illegible] G B PAGE MB RN

This paper is intended to be a [illegible] methods [illegible] disposal for the treatment [illegible] Most medical officers will agree that this disease is [illegible] in the Royal Navy as anywhere else but at the [illegible] useful to review the position of affairs so far as practice [illegible] Without then presuming to add to anyone's knowledge I will [illegible] to discuss the principal methods of the day

Permanganate irrigations or injections have come [illegible] as the most efficient routine treatment in the Royal Navy and nothing is likely to replace it for the time being [illegible] perhaps the ever increasing price of permanganate and [illegible] The exact procedure differs in the various ships and establishments Irrigation thrice daily with a pint of warm 1 4000 solution at a pressure of about 7 ft from the ground is quite satisfactory While it is true that other methods of local treatment are used in special cases these cannot be said to have gained a firm footing in naval practice

Local treatment falls under two headings —

(1) The application of antiseptics

(2) Artificial congestion

I will deal with congestion first This is obtained by means of Klapp's suction bell which is applied intermittently over a period of one hour daily "This apparatus has given good results in some large institutions, such as the Royal Infirmary, Edinburgh "In recent gonorrhœa the discharge rapidly diminishes, and there is a remarkable absence of complications [1] This procedure is never likely to come into general use as it needs constant skilled supervision and moreover the apparatus is fragile to say nothing of being German made and therefore unobtainable at present

Of the antiseptics suitable for injection the salts of silver rank after permanganate of potash on account of their special action on the gonococcus They are nitrate of silver and its organic compounds (protargol albargin largin &c) Last year I used silver nitrate in the following way with considerable success my intention being to attack the gonococcus first with silver, and later to

[1] Thomson and Miles Manual of Surgery Fourth Edition vol [illegible] p 745

eliminate other organisms [illegible] the discharge with [illegible] [illegible] irrigations daily of 1 5 000 nitrate of silver Each irrigation consists of one pint of fluid as hot as can be borne given by means of an ordinary douche can and tube, the tube ending in a medium sized Mauoch tube The douche-can should be suspended 4 ft above the patient's abdomen The patient having passed water holds the penis as far back as possible with the left hand and applies the irrigation tube with the right hand If it is thought that the fluid is not passing properly down the urethra partial occlusion of the outlet limb of the urethral tube by the patient s forefinger will increase the pressure sufficiently The tubes are kept in 1 1 000 perchloride or other antiseptic lotion and rinsed in water before and after use In an uncomplicated case little or no discharge will be seen on the eighth day and on the tenth the silver is stopped Permanganate is now substituted (1 5,000) and kept up for four or five days when the patient should be clear of disease This mode of treatment has given very satisfactory results especially in cases treated early The discharge ceases in twelve to twenty days

It is to be noted that injection of any compound of silver may cause the disharge to become thicker during the first twenty four hours , patients should be warned of this

Irrigation is very much to be preferred in the Service to syringing as it is cleaner and more efficient As regards efficiency a surprise visit at injection time to any large venereal department where syringes are used will demonstrate the point The perfunctory squirting which some patients indulge in when not under the doctor s eye is quite useless though often due to ignorance and laziness, rather than to a desire to prolong the disease

Protargol may be taken as typical of the organic compounds of silver It is soluble in water the solution being most conveniently made by adding cold water little by little and stirring in a mortar For irrigation purposes it has no advantages over the nitrate and is much more expensive Under certain circumstances such as when a patient can only attend once a day it is very useful as an injection The solution which may be gradually increased from 1 to 4 per cent should be freshly prepared with cold water The patient having passed water sufficient is injected with a *large* glass syringe to distend the urethra by pressure after which the patient grasps the glans penis to retain the fluid At the end of ten minutes the fluid is allowed to escape and should do so with a decided spurt Distension of the urethra is absolutely necessary to success and for this

reason the ½ oz syringe ordinarily supplied is no use The average urethra holds more than 4 drachms often 6 sometimes more The first few injections are always painful and one may have to start with ½ per cent. solution This method has proved most successful in my hands when administered personally, probably because sick berth stewards fail to get the proper distension or do not make the patient retain the solution long enough There is no reason why this treatment should not be entrusted to an intelligent patient The outfit is very small and it is easy to imagine circumstances where the method would be most convenient

Albargin, which is favoured in some civil lock hospitals, is used in weaker solutions and appears to be more powerful than the other organic compounds of silver Nargol is used as a prophylactic in the Navy

Other substances used for urethral injection are Zinc sulphate chloride, sulphocarbolate and permanganate lead acetate bismuth subnitrate alum, ferrous sulphate sodium sulphocarbolate and biborate (borax), boric acid and tannic acid

It will be noticed that most of the substances in this list are astringent rather than antiseptic and have little place in the treatment of acute gonorrhœa whatever their value may be in gleet The salts of zinc however are important and frequently used Permanganate of zinc is a powerful antiseptic and astringent probably much more so than the potash salt, but more expensive It is used in exactly the same way The sulphocarbolate is freely soluble in water It is inferior to silver or the permanganates

I have never heard of anyone injecting solutions of formaldehyde into the urethra but it is worth while remembering that very small quantities are strongly germicidal

The irrigation method sometimes known as Janet's, in which weak permanganate is permitted to enter the bladder (1 6 000 or 8,000), has not found favour in the Navy Its use in acute anterior urethritis is open to obvious theoretical objections which however do not seem to be realized in actual practice I believe it is used in some military hospitals and on the Continent, where it is said to be especially valuable in obstinate cases

There are few parts of the body that the medical electrician has not attacked and no review of the treatment of acute gonorrhœa would be complete without a reference to the electrolytic method

The treatment is carried out by inserting a perforated platinized canula filled with a solution of sodium iodide (2 per cent) and

iodine (0 1 per cent) A platinum wire is passed down the cannula and connected with the positive pole of the battery A very weak current is passed for a definite period and then reversed for the same period The method is still *sub judice* Having no experience of it I will quote a recently published paper[1] There is no doubt that the treatment rapidly reduces the discharge and practically none is visible at the meatus in from eight to fifteen days Our experience, however, up to the present is that the gonococcus is still to be found in the smear taken from the meatus first thing in the morning after the all night non urination

The introduction of the cannula requires great care and patience in the highly sensitive urethra of acute gonorrhœa, even after a previous injection of cocaine down the canal

Since attention to detail is the secret of success in treating gonorrhœa, one may be permitted to mention a few general points The question often arises whether patients should lie up or not In private practice this is often desirable but in the Service medical officers naturally object to crowding the sick bay and increasing the number of days sickness in the returns A great deal can be done by insisting that patients wear close fitting bathing drawers to support the penis and testicles also penis bags with frequently changed antiseptic wool whenever the discharge is copious

Severe cases must be put to bed, and in the tropics all benefit by a few days rest and low diet

Patients are always warned about the infectivity of the discharge, but not always given the opportunity to observe the caution Every venereal department should be provided with swabs moistened in antiseptic with which the patient cleanses the foreskin and glans before injection and also a bowl of antiseptic for rinsing the hands afterwards

The importance of avoiding alcohol is generally recognized and in the Service afloat this is easily enforced, but difficulties may arise in large shore establishments where beer is obtainable at the canteen One cannot overestimate the value of an initial purge and the subsequent regulation of the bowels by saline

Finally I must refer to certain adjuvants—diluents, diuretics and disinfectants

Milk and barley water are such excellent diuretics and diluents that drugs seem unnecessary The mixture known as unist alkali '

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[1] Major Fiveash R A M C the *Practitioner* vol xcvi p 400

(consisting of tincture of hyoscyamus, potassium nitrate and alkaline bicarbonate) is often given in gonorrhœa While useful in other urinary conditions such as gravel hyperacidity, &c, its use in gonorrhœa is to be condemned on the ground that anything which markedly diminishes the acidity of the urine assists the growth of the gonococcus

It would be better to give hyoscyamus in a neutral mixture Local pain and spasm, however usually yield to rest hot baths and hot applications

The common urinary disinfectants are Hexamine, copaiba sandalwood oil and cubebs

Hexamine (official B P 1914) is one of the best urinary disinfectants we possess It is also diuretic It is antiseptic because in the presence of an acid it splits up into formaldehyde and ammonia, the latter being neutralized by the acid Ten grains three times a day well diluted with water give good results If the urine is only slightly acid neutral or alkaline it must be made acid by giving acid sodium phosphate or sodium benzoate *for a day or two before* the hexamine Hexamine is very useful in the later stages of the disease and in relapses

Failures are due to two common mistakes (1) exhibition of the drug when the urine is alkaline (2) combining the drug with acid sodium phosphate to render the urine acid [1]

If the second mistake is made the hexamine instead of circulating in the blood as a non-irritating compound and splitting up in the urine decomposes in the medicine bottle I have noted this mistake in print several times

An authority stated last year that he considered copaiba useless and that it produced a rash in one patient out of every three I can honestly say that I have never seen any benefit result from this drug, and that it often produces a rash and upsets the digestion During the acute stage of gonorrhœa it does harm and during any other stage its value is doubtful Sandalwood oil like copaiba owes its properties to a volatile oil It is pleasanter to take and less upsetting to the alimentary canal It imparts a very evident odour to the urine It is a useful disinfectant and judging by the amount sold in various forms by chemists enjoys considerable popularity Cubebs also contain a volatile oil I have no experience of it in the treatment of gonorrhœa

It will be seen from this survey that there is very little new in

1 Bullar in the *Practitioner* vol xcvi p 405

the treatment of acute gonorrhœa Cases which do not yield to one or other of the methods described have passed into the realm of complicated and chronic gonorrhœa and beyond the sphere of this paper The *fons et origo mali* must be sought for and dealt with

When is a case of acute gonorrhœa cured? It has been said that every attack of gonorrhœa is curable except the first We can all remember numerous cases which have relapsed after apparent cure as a result of alcoholic indulgence, sexual intercourse, or even unusual physical exercise I remember a rather stout private of Marines who developed a discharge as the result of climbing the steep slopes of an island in the Red Sea He had certainly had gonorrhœa long ago, but had had no chance of re infection for weeks, and there was certainly none on the island

The continental test is said to be the capacity of the patient to drink beer without provoking a return of the discharge Another method is to make a provocative injection of silver nitrate in 1 per cent solution and examine the resulting discharge microscopically The Service method, which is simple and practical, is to stop treatment and to place the patient on eight days quarantine examining daily for the slightest evidence of discharge The microscope is sometimes useful, but after all a gonococcus lurking in the recesses of the urethral mucosa may easily elude the most persevering microscopist

Note—Since the above was written Mr Charles Russ, of London has published a series of results in 100 cases treated by electrolysis (*Practitioner* September 1916)

His views are more optimistic than those quoted He uses a small platinized catheter which is easily passed, though sometimes a little 2 per cent stovaine is advisable No injections or lavage are practised sandalwood oil may be used when the discharge has become slight and vaccine is given in rheumatic cases The series consist of 69 acute (arbitrarily fixed at under fourteen days duration) and 31 chronic cases The average number of treatments required in the acute cases was 16 (minimum 5, maximum 34) The average number necessary in chronic cases was 20 (minimum 14, maximum 35) Complications seem to subside with the urethral discharge, but epididymitis is noted as being one of the liabilities of deep urethral instrumentation during gonorrhœal suppuration

It is possible that the method may become a valuable one in Naval Hospitals and sick quarters at depots

A [illegible] OFFICER'S IMPRESSIONS OF A VISIT TO THE TRENCHES

[illegible] MARSH [illegible]

During the year 1916 [illegible] the Admiralty and War Office respectively to send a [illegible] naval officers to gain experience of trench life and [illegible] number of army officers to experience life afloat in H M ships under war conditions The object the authorities had in view was it may be presumed to strengthen the sympathetic bond coupling up the two great fighting forces of the Crown by affording to each opportunities to learn a little of what was going on in its sister Service For this purpose—so far as the Navy was concerned—officers were encouraged on their return, to give lectures on their experiences to the ships companies As one of those who were accorded the privilege of visiting the front trenches I am venturing to recount the impressions I gathered generally in the hope that they may not be altogether devoid of interest to other naval medical officers

At 9 30 p m May 23, on the Folkestone platform of Charing Cross station I joined up with Commander Maitland Kirwan of H M S "Lion" Major Hickson of the "Defence" Mr Elliot, R M C of the New Zealand and about fifty men and petty officers from various ships of the Grand Fleet We arrived at Folkestone at midnight and as the train did not go beyond the town station we were compelled to march to the steamboat which lay alongside the jetty in the harbour a mile and a half away In consequence of this we did not get on board until an hour and a half after midnight but despite the lateness of the hour we found confronting us a huge supper, of which the men ate heartily before turning in, though I think most of the officers were only too glad to seek the seclusion of their cabins The boat was originally scheduled to leave Folkestone early a m on May 24, but for military reasons connected with the transport of troops was postponed until 5 30 p m of that day I must try and describe as briefly as possible the scene of embarkation Pouring in through the gates of the wharf one sees an incessant stream of khaki clad troops there is no shouting, no rushing wildly about in a word there is none of that "panic" that accompanies faulty organization This living stream flows sluggishly but steadily along until it reaches a point opposite the first of three black-funnelled steamers lying alongside the jetty here a side branch spontaneously disentangles itself from the main stream and after threading the gangway up the first steamer breaks up as the men scatter themselves over the various decks A little further on a second stream diverges from the main one and pours itself into the central steamer This was the one we were in—and thus I was exceptionally fortunate in commanding a good all round view of the embarkation generally The end of the stream disappeared in the third ship As each man officer or lady—for there was a sprinkling of sisters nurses and others of the gentler sex in uniform—stepped on to the gangway, a pass had to be produced for the inspection of a transport officer stationed at the foot of the gangway As the troops poured inboard the

vessel took on a considerable list to starboard and one could see her draught steadily increasing as she settled down in the water. I believe the Board of Trade carrying capacity in peace time for these boats is about 800 men, but the exigencies of war have brought about considerable latitude in this respect and we certainly had more than 1,450 souls on board. In addition to the embarkation of the troops, there was all the time being quietly shipped forward much heavy gear, such, for instance, as Red Cross ambulance material, &c., and finally 2,000 bags of mails for our soldiers at the Front were dumped on board. A few women in uniform were on the jetty supervising some of the transport work, and one could not help noticing that a considerable proportion of the male transport personnel (blue lanyards appeared to be their distinguishing badge) were either elderly or had been wounded. Now the scene I have attempted to describe is to be witnessed any and every day of the week, either at Folkestone or Boulogne and if further evidence of the immense amount of labour and forethought involved in the organization of this section of transport were necessary I might dilate on the enormous number of troops that are daily conveyed across the channel proceeding on and returning from leave in the home country, or "Blighty" as it is affectionately known to Mr. Atkins. The moment the ship got under way all officers and men and of course women were served out with life belts. The sea was like a mill-pond and in a couple of hours, that is about 7.15 p.m., we were tied up to the jetty at Boulogne. Here we were met by an officer of General Haig's staff who informed us that three motor lorries and the General's own car had been placed at the disposal of the men and officers. The men were driven to a club and we were taken to the Hôtel de Folkestone, where we dined and slept the staff officer returning alone to headquarters the same evening.

At 6 the next morning, May 25, the car and lorries "shoved off" from Boulogne. At 9 o'clock we pulled up at a place about 30 miles from our starting point and in a *salon d'hotel* partook of a little light refreshment in the shape of a large basin of steaming chocolate and rolls and butter.

Now up to the present there was little to indicate that the country through which we were being carried was in the throes of a desperate war. Soon, however, we began to pass various working parties in khaki, mounted infantry, motor cyclist despatch carriers, ammunition lorries and so forth. The lorries for the most part were stationary, marooned, as it were, on the side of the road off the main track. Many of them, to judge by their interior, were mobile workshops, others were medical and in one we caught a glimpse of a soldier, head well back—in a dentist's chair.

We passed by several "working parties"—some of these we were informed, were composed of "Conscientious Objectors"—others of the so-called "Navvies" of "Garrison Brigade." The work of these men consisted in road repair, wood cutting, quarrying, line laying, and so forth, all of which was carried out well behind the danger zone. There would

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For obvious reasons I cannot make any reference to points on the map. The reader will therefore forgive me for alluding here and elsewhere in these pages to localities in this very vague manner.

seem to be [illegible] sion among [illegible]
cery whispered [illegible] is Gospel [illegible]
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rumours have become [illegible] but I might [illegible]
there as it was told me while at the sa[illegible] [illegible]schiman[illegible]
bility for its severity or otherwise. A certain Member of Parliament [illegible]
is or who—shall we say—poses as a spokesman with the Cenotaph [illegible]
Objectors had been [illegible] into the [illegible] they had been placed by the military in crudely exposed positions and that they had consequently suffered heavy casualties. He [illegible] got up in the House and demanded to know exactly what [illegible] the casualties sustained. I fear the answer he is alleged to have [illegible] was neither expected nor desired. Casualties from [illegible] men—nil. Seven cases have been under treatment for recent [illegible]. However let us be just and tolerant, the particular [illegible] in these nice on the Continent devoid of the actual risks of battle [illegible] though it may be is highly valued. Further since their [illegible] on the Continent many of them have had their eyes opened to the real state of affairs, and have [illegible] the extremely illogical [illegible] to hold and are now joined up with the fighting forces. Working parties of the Navvies or Garrison Brigade consisted of a somewhat [illegible] assemblage of men seriously assorted as regards age and general appearance. They appear to have been recruited from all sorts of [illegible]; there was a man hatch out of his [illegible] and there was one veteran of seventy. There was an old [illegible] and by his side a man who had never seen what we should call pucker military service. Some of the men had been wounded and invalided out of the Service but had recovered sufficiently to do this kind of work. And real good patriotic work it was too as everyone out there will testify. The duties of these [illegible] are well behind the firing line and of a nature as just specified. Now it may well be imagined that in a company or platoon of [illegible] the units of which have been drawn from such very widely different sources and many of whom have never seen regular service some amusing incidents occur. Thus on one occasion the General was coming down to inspect a piece of work—let us say a bombproof emplacement—these men were building. A small earthwork or parapet was being thrown up and the front portion of this was covered with slabs of turf which should have been placed that the grass side was outermost, so that from a distance the emplacement would assimilate with the general environment and be more or less invisible. By a mistake however the grass side of the pieces of turf had been laid underneath. When the General arrived the officer in charge had fallen in all his men with their picks and shovels to receive him. The General's first remark was "Bet sixpence Mr So and So you've turned the sods the wrong way!" Of course the General was referring to the turf but the platoon officer's response was "Squad about turn!"

At 11 a.m. we arrived at a town with a large market square that was literally crammed with motor lorries of every description. Here for the first time we heard the boom of distant artillery. Very few civilians were in evidence and the majority of the few women going about their business were in black. The following incident may interest those who

have to do with horses. A mounted officer was trying to get his horse to enter a certain side street, across a part of which had been placed a temporary barrier to stop wheel traffic, but which allowed of ample space for the passage of a horse in fact, this horse had been past this particular barrier some dozens of times. To day, however, despite whip and spur causing cursing and pulling the horse for some unaccountable reason obstinately refused to enter that particular street. The puzzled rider was about to give it up and turn away when a little boy, pointing to a brazier lying underneath the middle of the wooden barrier, called out "Fumes!" A scarcely noticeable wisp of smoke was rising from the brazier but the horse had spotted this and taken exception to it; the brazier was placed on the pavement and the horse walked past the barrier of his own accord. We had lunch at the officers' mess and the petty officers were conducted to the N.C.O.'s mess for the same purpose. After our refreshment we were shown some large maps and given a general birds eye view of the situation by one of the staff officers. Each one of us was given a map of the trenches and, finally, every member of the party was provided with a shrapnel helmet and a gas helmet and was put through a "gas drill," that is to say, instructed how to use his gas helmet. After this we got into the car, the men into their lorries, and were whisked off towards the trenches, and in a few more minutes pulled up and dismounted, having arrived at the end of our journey so far as petrol was concerned as a motive power. We were now at a farm about a couple of miles from the nearest trench line. Here we were split up into four groups averaging a dozen to the group, one under Commander Maitland Kirwin, one under Major Hickson, one under Mr. Elliot and one I accompanied. I saw nothing of the other three parties until the day that we returned to Boulogne, so that my future remarks are confined solely to my own.

To the Firing Trenches on Foot

First of all I was conducted to the Brigade Headquarters, where I was introduced to and had tea with the Brigadier General. The sound of our own artillery was close at hand and I could make out the position of one or two of our batteries. That we were now well within the zone of the enemy's shell fire was evident from the whizzing concussion and cloud of dust, that here and there one heard and saw around. Tea over I was conducted from Brigade Headquarters to the Battalion Headquarters, a stage nearer by about a quarter of a mile, to the front trench. Here I met the officers with whom I was to spend the next few days, and very lucky I was to have hit off a rehef night—an event as I will describe later, of immense importance in trench warfare—for a company of the officers and men were preparing to go down that very night after dark to relieve the company now in the trenches, and it was with this company that the naval men and myself were to go.

Of course the Army officers were all very interested in the Navy, wanted to know all about the work we were doing especially with our submarines. I, on the other hand had my interest centred in their doings, but as soon as I manœuvred the conversation round to Army work back they would switch it to the Navy. Especially interested was Captain B—— in the Navy, he himself having once been a naval cadet

at Osborne I asked him why he left our Service—perhaps rather a tactless question as it caused a certain amount of hilarity—and he spun the following yarn which I will repeat in his own words It was all owing,' he said laughing to a spirit steel cube I was undergoing a course of instruction in the workshops and my instructor handed me a steel cube and told me to turn it into a sphere of that metal After many days hard work I produced my sphere only to be told 'If you cannot do better than that try and turn the steel sphere into a cube So I worked away and made what I thought was a fairly good cube but no my instructor was not satisfied and told me to convert it into a sphere Well this went on until there was neither sphere nor cube left—all had disappeared in turnings Shortly after that I was sent to the "Hermes" and spent three very seasick weeks at sea after which I left the Navy Captain B.—— had been out at the Front ever since the beginning of the War He was a great favourite with his brother officers and the General spoke of him as one of his most promising sub ordinates he had already won the Military Cross, and his men simply worshipped him and would follow him anywhere to shart the Navy had lost, and the Army had gained, an exceptionally good officer

The Battalion Headquarters are situated in an ideal spot on the sheltered side of some rising ground about 1 600 yds from the trenches The whole of this elevated ground which I will call Hill 'x' ("x" indicating its height Hill 40 or Hill 100, for instance means that the hill is 40 or 100 *metres* high) is thickly covered with trees and this also applies to half a mile or so in rear of the hill This wooded district has scarce a tree that does not show gashes or holes made by shell or from the back of which one could not scoop a shrapnel bullet Many of the trees had been actually felled by shell and the stumps of the trunks 5, 10, 15 or 20 ft high as the case may be are to be seen, scattered about the wood, frayed and frizzled out at the top like so many monstrous shaving brushes The shell that daily fell into this wood appeared to be of four kinds so far as my first experience was concerned The daily "strafe," generally between 7 and 9 o clock in the morning, was with a small howitzer shell about 4 5 in to 5 in calibre this burst on impact and, if it struck the ground, made a crater about 3½ ft. deep 3 ft wide (as measured at right angles to the shell s travel) and 4 ft long (as measured in the line of the shell s travel) If these missiles struck a tree squarely even though the latter was 9 or 10 ft in circumference, they burst during perforat on and so severed the trunk They came from enemy batteries 5 000 to 6 000 yards distant and had a high angle of descent and one could hear their moaning approach many seconds before they struck It was interesting to watch the behaviour of the well seasoned old timers when these shells were flying around during a 'strafe' Directly he heard the moan of the approaching shell he would stop turn his ear to the source of sound, and then carry on nonchalantly with what he was doing some seconds later the air would reverberate with the burst of the shell two or three hundred yards away or he would run and scramble behind a tree trunk if the shell threatened to fall in his immediate vicinity The seasoned soldier never 'ducks' at a bullet or shell of high velocity for he knows that he hears it *after* it has passed, the high angle shell loudly following in the wake of its own sound wave gives him a certain amount of warning as to when and

where it is going to descend and he alters his conduct appropriately. Then there were the "whizz-bangs" shells impatient, high velocity flat trajectory, 3 in calibre missiles, that came passed and burst all in one sat so to speak. Some of these fell in the outskirts of the wood but few succeeded in reaching the middle they were however, unpleasantly common on the top, and along what we would call the weather side of the hill. They were fired from batteries much nearer our lines than the former type they also were impact bursting shell. Then there were shrapnel shell which, as a rule, burst high overhead by means of a time fuse. They gave rise to a curious echo that reverberated through the wood and differed from the two previous types in that they threw up no cloud of dust. Furthermore after the burst up in the air one could hear the pellets and fragments falling through the trees. As a rule they left but a small trace in the air of their bursting, although occasionally they left a dense white opaque cloud. I shall refer to this latter at a later period when I come to describe how the German obtained the range of certain woods that suspected of concealing our howitzers. Finally there were the anti aircraft shell fired by the enemy at our aeroplanes. These were constantly falling in the wood when our planes were near the enemy lines. Two fell near my dug out early on the morning of May 29 and I brought them back with me as mementoes of the good time I had out there they are approximately 3 in calibre and when full, with time fuse &c. attached weighed about 18 lb. shell of this type contain a charge in the base the time fuse being in the nose of the shell and connected with the bursting charge by a hollow tube running down through the centre of the shrapnel balls. They burst very high up in the air, the actual height depending of course on the altitude of the air craft. The detonation of the charge in the base of the shell blows off the anterior ogival end and throws out the shrapnel, but does not burst the cylindrical case which falls several seconds after the appearance of the white cloud up in the air, intact. We may assume I think that on bursting these shells still retain a fairly high remaining velocity and that they are oriented more or less nose upwards that is towards the aeroplane. Hence when the basal charge is detonated the shell as a whole behaves like a gun that is itself travelling through the air so that the velocity of the shrapnel balls on their departure from the case is the remaining velocity of the shell plus the additional velocity imparted by the propulsive charge in the base of the missile. This would account for what I noticed on more than one occasion when our aeroplane was being shelled. First, one could see a puff of white smoke appear somewhere below the aeroplane high up overhead then four or five seconds later one would hear the report of the bursting shell not for another fifteen seconds or so did the empty case crash into the undergrowth, and yet a further ten seconds lapsed before one heard the thud of the score pieces or the rattling amid the branches of one or two of the widely dispersed shrapnel balls. One of these empty cases struck the dug out behind that in which I was on the morning of May 29, narrowly missing the Sergeant Major who was standing about 4 ft in front of the entrance to the dug out shaving. I was similarly occupied in front of my own dug out, heard the noise but had no idea it was so close until the Sergeant came up to ask me to go and see the narrow escape he had had. I went. The shell had passed through one sandbag at the edge of the roof of the

[illegible] itself about a f[illegible] sandbags that f[illegible] to the entrance, th[illegible] bean down its [illegible] ntion s[illegible]

[illegible] that night May 25 and in pouring [illegible] the relief party [illegible] or the trench [illegible] unguarded by or [illegible] civil party By the time we reached the top of the hill it was dark [illegible] despite the darkness and the rain a most wonderful and impressive sight was laid open to our view The whole of the German trenches [illegible] them of course our own, were lit up at intervals by powerful searchlights which were being incessantly shot up into the sky over a line as far as the eye could reach from right to left It was like a fireworks display [illegible] you would see a dull snake like trail of sparks rise in the air to 1000 ft or so and then a glorious burst of white light which would slowly [illegible] earthwards lighting up our whole trench line as though it [illegible] the light was being played on them These searchlights and [illegible] lights threw their maximum illumination over our trenches [illegible] they also lit up the ground for several hundred yards on either side [illegible] No Man's Land and the German trenches Not a light [illegible] shot up from our own trench line so I asked the Captain of the company the reason of this pyrotechnic display on the part of the Huns and why we were not contributing to it The Germans have got the wind up over a night attack they are like children—nervous of the dark We have no reason to fear a night attack and even if we did there is no need to strike lights and waste money while [illegible] is so [illegible] descending [illegible] Wind up [illegible] Atkinson for all at the Yank would call [illegible] It would appear that the enemy are now in constant dread of a night attack along the whole front and especially of one in the cover of darkness The rain of star lights is therefore an expression of [illegible] uneasiness From sunset to sunrise there is at least one star light in the air every 300 yards or [illegible] and often there are three or four and I estimated roughly that [illegible] 1000 must be expended per night if [illegible] during the short hours of summer darkness [illegible] means [illegible] big expense We were now spread out in single file about 18 or 20 paces between each man and strict silence enjoined As we were [illegible] down the hill side we found the star lights very useful to [illegible] in showing up the various pitfalls and obstacles but it was not [illegible] the sharp crack of rifles and the deeper stutter of the machine guns [illegible] of the pitter-patter of passing bullets and the [illegible] shock [illegible] of those stinking shells made one wish that it mainly was a little less lavish with the illumination Imagine the feelings of a man on the single file [illegible] an unsympathetic audience when the [illegible] mud hill on to him and he discovers he has forgotten his pass [illegible] he certainly may have a vague idea of what is to find himself standing [illegible] upon pounding rain within three hundred yards of the enemy and with a [illegible] white light like the bow lamp of a motor car on his head [illegible] as it may seem provided one keeps perfectly still while the light is vivid one is quite invisible or rather [illegible] the less Irish [illegible] and outline so assimilated with the usual aspect of an average Irish [illegible] that it was impossible at a hundred yards [illegible] between them We passed a working party of sappers [illegible] a trench for a [illegible] wire and I could not help noticing the attitude of one of the men [illegible] caught so to speak, by a flare light in the act of [illegible] rain

a spadeful of earth There he stood rigid and motionless as though carved in granite, back bent, face turned to the ground, and in his hands the spadeful of clay When the light went out he resumed his digging Footbridges over ditches and brooks cross roads and any point towards which men would be compelled to converge, required extra careful negotiation for the bearing and distance of every one of such nodular points are known to the German snipers and machine gunners who have an unhappy knack of suddenly striking them on the chance of hagging someone Across such points, therefore one had to stoop and run for it, or if it was in the daylight crawl across On one such footbridge I came across the following laconic advice painted on a signpost, "If you stoop you'll get it in the neck and if you don't stoop you'll get——!" A notice such as this appeals to one one recognizes its honesty and simple lack of all interior motives! There was one very nasty quick firing gun that compelled us all to lie flat, but fortunately it only went off at about ten minutes' interval The gun was obviously fired while being swung through a horizontal arc, so that the pattern of the bullet tracks was that of a fan, the handle of which was at the muzzle of the gun and the top curved edge of which was our front parapet, and all the bullets that missed the parapet came zipping into the open ground behind across which we were leaving our way New this machine gun would fire from right to left and then it fired from left to right Nearly all casualties as the reader might well guess are contracted not in the front trench itself, but in the open ground behind among the working parties or the relieds that is the reason why each side is so anxious to learn the relief nights of the other, for the chance of placing men *hors de combat* is then immensely increased and well worth a higher concentration of fire Now all this time one has to imagine the rain as coming down in torrents and our mean speed as very slow Our men were slipping about everywhere and every now and then one would hear a splash and a heartfelt imprecation as some extremely un jolly tar scrambled out of a flooded crater to the accompaniment of the but partially suppressed chuckling and giggling of the more sure footed and more practised soldiers Another 100 yds or so and we had arrived at our destination—the firing trench, barely 200 yds from the Bosches line We did not form a very impressive spectacle, most of us looking extremely wet and bedraggled But we were cheery withal 'Hello there' cried out one of the Tommies to our Bluejackets 'What regiment are you?' "North Sea Marittimals" was the prompt reply It was now 11 30 p m the men were allotted their dug outs but it was discovered there was no sleeping billet for me owing to the fact that it was relief night and an extra number of officers had to be accommodated There was nothing for it I would have to face that journey again and go back to Battalion Headquarters I would willingly have slept in the open against the rear parapet where it would be perfectly safe but the ground was inches deep in water and the rain was descending in torrents I remained in the trench therefore, until all our men had turned in and I had seen all there was to be seen and at 12 15 started back to the company of a sergeant as guide I won't describe the walk back, how my guide, owing to the intense darkness, lost his way time after time but will merely say that I arrived back at 2 20 a m very weary to find the Adjutant sitting up and somewhat concerned as to my whereabouts, for the Captain of the company had telephoned

from the [illegible] say I had left it at midnight I [illegible] clothes [illegible] day and was speedily dead to the world [illegible]

At 3 next morning (May 26) I awoke with a start to the concussion of a howitzer shell which seemed to me to shake the whole of the wood and which undoubtedly shook the dug out to its core For half an hour shell after shell fell amid the trees, and overhead our own four pounds went shrieking past on their errand of retaliation It is just the morning strafe said Carrie "sometimes it's one wood and sometimes it's another to day it is ours They give it us, and we take it as methodically as a morning cup of tea—in fact as a rule we do not even bother to wake up At 9 a m I was once more on my way to the trenches, but this time instead of going by the short route taken under cover of last night's darkness I had to go by a long and circuitous path, striking the trench a good half mile to the west of the company with whom I was billeted and being, therefore, compelled to thread my way through a regular maze of front trenches held by another regiment At last I came to a brook, dignified on the map by the name of river crossed this, and was in my correct trench and very soon in the officers dug out which figures as the mess and sleeping quarters On that particular morning the enemy had turned a howitzer battery on to a hundred yards of trench connecting us up with the next regiment to our east, and a pretty old havoc they had made of it too Most of the front parapet had been razed to the ground, props had been broken up and sandbags scattered far and wide Fortunately this portion of our trench line was very thinly occupied at the time and the Captain of the company was able to withdraw every man without sustaining a single casualty The estimated damage was shown by the Company officer's demand for 4,000 sandbags which were sent up to Headquarters that same morning These sandbags are valued so I was informed at 3d apiece hence that morning's strafe on our bit of trench cost the Government just £50 for sandbags alone But what did it cost the enemy for shell? The prevailing idea at home is that men in the trenches when under shell fire fly for refuge to their dug outs whereas the exact opposite is the case, they leave their dug outs and spread themselves out behind the parapets The trench dug outs are made as a protection against rifle machine gun, and trench mortar missiles and grenades and they are not constructed to withstand the shock of heavy plunging shell from howitzers which blow them all to pieces and would kill every man inside And so on the principle that under certain circumstances it is better not to have all your eggs in one basket, it is found that casualties are reduced to a minimum by spreading the men along the line side of the parapets When we come to deal with the dug outs in positions further to the rear such as those in the observation posts, Battalion headquarters howitzer and field artillery batteries we shall see what a complicated structure a modern shell proof dug out really is The Germans on the contrary do construct shell proof dug outs in connection with their front line trench that is to say they rabbit hole down into the ground at intervals along their trench line and so spacious are some of these shelters that in more than one instance where we have captured a front trench we have found a piano in the dug out

I will briefly describe the section of trench held by the regiment with which we had the honour of being billeted The German and British

trenches separated by about a mean 200 yards of No Man's Land ran approximately from north west to south east. Our trench was separated on the left from that of the next regiment by one river and on the right from that of the next regiment by another river—I say river because they were so called but they are only small streams.

Now, this stream runs first through the German lines then through the British lines then again, after being joined by another stream flows again through British and again through German lines and on this curious disposition hangs a tale.

Notices are posted up in the trench at the points where the brook crosses it: "*Men are not to use this water for drinking or cooking as it is liable to contain copper and strychnine.*" I do not think the soldiers of the present regiment ever had any cases of poisoning from this source though I was informed that there were such cases among their predecessors.

Most of the original Belgian names have disappeared and have been replaced by such pet names as appeal to the soldier, for instance, Regent Street, Piccadilly Circus, the Elephant and Castle, and so on or by names that are clearly stamped with their origin, such as Mud Corner, Strapnel Alley, Sinking Farm, Hot Corner &c. There was once a fine house until it attracted the German eye; it is now a pile of bricks that pathetically figures in the military map as "Donald's Ruin." How a Scotsman came to take up his residence in this part of the world, we are not told, though it is comforting to be assured his ruin was neither encompassed by wine, whisky, nor women but by whizz bangs. Now that I have given a bird's eye view of our trench environment let us return into the trench itself. When I arrived I found every one simmering with excitement on account of the howitzer's "strafe," an experience they had not had for some months. The Commanding Officer was particularly pleased with himself in that he had not sustained a single casualty, though he shook his fist at the Huns when he realized the amount of night labour this repair of the hundred yards of damage would entail. "I couldn't help thinking of Barnsfather this morning," he said laughing. "In the middle of that strafe, with sandbags flying about all over the place I was called to the telephone and the message I received was 'Send names of two men for next furlough.' It reminded me exactly of Barnsfather's picture of a dug out being blown to smithereens while amid the dim the officer inside slowly spells out the message from Headquarters "How many pots of raspberry jam were issued to you last Friday week?"

To-day was a fine hot summer's day and our men were chatting with the soldiers and drying their clothes after last night's soaking. I could not help overhearing a Tommy explaining the general situation to one of the sailor men. He was pointing towards the ground across which we had come last night and said, indicating some craters, "Do you see all those holes filled with water?" "See em? See em?" indignantly asked the bluejacket "Didn't I bathe in em?" To day Captain B was sent with some written orders to the detachment on the other side of the river already referred to on our right, and as men and officers are not supposed to go about alone but in couples in case of accident I asked and obtained permission to accompany him. The difficulty was to get past the hundred yards of trench the parapets of which had that very morning

been laid at intr[illegible] [illegible]
trench was, of co[illegible]
which just hem[illegible]
had to crawl o[illegible]
We arrived at the [illegible] without mishap [illegible]
by lying full length o[illegible] the plank and pull[illegible]
aims bit by bit. Twenty more yards and we [illegible]
and could once more walk in an upright position. We [illegible]
mud and steaming with perspiration for the day was [illegible]
glad I had come as after Captain E. had ordered his [illegible]
opportunity of seeing one of our trench guns being tri[illegible]
the purpose of being damned.

After a rest in the officers' dug-out and a little liquid [illegible]
we commenced the return journey. Again we crossed th[illegible]
entered the damaged communication trench. Captain E. had just
[illegible] open gap when a bullet whistled through it and splashed
into the mud. So we sat and patiently waited one on either side and
[illegible] well we did so for in the next five minutes three more bullets came
through that gap and then the sharpshooter let it alone. He had spotted
[illegible] both going down and Captain E. returning so heavy there was [illegible]
unaccounted for. Needless to say when the unaccounted for one had
crossed it is the primitive method of the hurdless serpent. When
I had got up to my companion he had crawled on a little way—I found
him lying down and leaning a head on some object with his revolver.
Unfortunately the object saw my head coming round the corner and
scuttled off in the shape of a large brown rat. Rats are so numerous
that one of the officers obtained a certain amount of revenge by
potting it them in the unoccupied communication trench. I'm [illegible]
to judge by their numbers have a fairly safe time of it. This [illegible]
two of these German aeroplanes came over our lines and were fired at by
our anti-aircraft guns. It was a pretty sight seeing the track of the
enemy plane mapped out as it were by white looking like little tufts
of cotton wool against the clear blue sky for each shell as it burst left
a puffy white cloud which remained suspended in the air for [illegible]
five minutes before it was gradually dissipated. While [illegible] lunch
to day in the dug-out the enemy treated us to a fireball of rifle and
mortar grenades which fell just behind our rear parapet. As a rule
these are ignored unless their number and zone of fall are such as to
indicate that the enemy's fire is not aperiodic but is organised and
concentrated on some particular portion of our trench. Then one
resorts to what is called "retaliation" which consists simply in giving
him back a more liberal and stronger dose of his own medicine. Having
ascertained by means of the periscope whence the enemy missiles
emanate a bombing party is despatched to reply to the fire. This is
generally sufficient to make Master Fritz behave himself especially if
we turn a trench gun on to him but if it is not, the artillery are appealed
to by telephone for "retaliation." On this particular occasion Fritz
was unusually obstreperous and dishumed our bombers by sending over
"pineapples" which shook our dug-out to such an extent that it literally
wobbled and for an instant I thought it was going to collapse. The
"pineapple" is the German torpedo a large trench mortar missile 4 in
diameter. This made Gregory wrath—and he sprang to the telephone

rang up the observation post and said, "We are being [illegible] pineapple, please retaliate." Then he turned to me [illegible] "Now listen!" Within four minutes a dozen of our shells were [illegible] overhead and bursting around the point the map reference [illegible] had given. The enemy did not worry us again for [illegible] time. Presently the telephone bell rang. The message was simply [illegible] "How's that?" and the reply equally so. "Yes you put the wind up them! Thanks!" Not always, however, was the retaliation so satisfactory, the shells were over or under or had fired [illegible] perhaps they even fell into our own trenches. When you reflect that our gunners were some four to six thousand yards away and that [illegible] hearing and range finding had to be done entirely by map and compass for they never saw their objective, when finally you remember that our and the enemy trenches were but 150 to 200 yards apart—and in some places they are closer—it will be realized that to put a shell into one's own trench is after all not such a very great crime as at first blush it might appear to be. It takes a very slight change of meteorological conditions to shorten a 5,000 yard range a couple of hundred yards. When shell fell short the reader may well imagine the telephone messages were not always so affable and amiable as those I overheard. On one occasion it was: "If you must shell us, please stop firing." The gunners stopped. Some hours later the infantry again rang up the gunners and asked them to retaliate on a machine gun that was annoying them. The answer sent back was: "If you can't stop a machine gun with your own machine gun you must lump it." There was always a little quiet leg-pulling between artillery and infantry. "Was the firing satisfactory?" the gunners once inquired. "Oh quite thanks. You didn't hit us!" Every one of the infantrymen however were agreed on one point and that was that the shooting of the gunners during an advance or general attack was marvellously accurate. Weapon to weapon it was superior to anything the Germans could do. The French despite their inimitable success with their 7.5 centimetre gun were meditating in their praise of our artillery. Said a French officer to one of ours about the shooting of our field guns: "C'est splendide magnifique—what you call not half!" At 6.30 p.m. this afternoon five of our aeroplanes passed over our lines on their return from a raid; they were very high up in the air. At 9 p.m. while at dinner more "pineapples" fell near our dug out but there was no need to retaliate for they soon stopped. Just after dinner I had to go out into the open to attend a sapper who had been hit in the abdomen by a bullet. The latter had not passed out so considering the close range it was probably a ricochet. The star lights were very useful for examining and dressing him. The unfortunate man was vomiting blood so it was a bad case and nothing could be done except ease his pain with morphia and despatch him by the bearers to the collecting station at the back of Hill [illegible].

The few casualties I saw were all sustained in the open, about 100 to 300 yds. behind the front trench, with two exceptions which occurred in the trench itself at night time, one of which was a bullet wound of the forearm and the other of the head. The latter undoubtedly owed his life to his shrapnel helmet for the bullet, which was from a machine gun, ploughed through about 4 in. of the steel helmet, then cut a long gash in the man's scalp grazing but not perforating the skull, after which it

again [illegible] and so on to [illegible] that ives
buckled and [illegible] head [illegible] upset
over a wid [illegible] recovered
I presume [illegible] heads [illegible] were looking
on our lines to [illegible] to pick them
out from the [illegible] which was
clearly discernible while [illegible] Whenever a
trench mortar or [illegible] gun was [illegible] high bearing
by means of sticking two empty [illegible] parapet
so that they formed a straight line [illegible] the flaring
was taken with a luminous compass [illegible] I have [illegible] remarked
when describing our march down to [illegible] through [illegible] that
one of their machine guns went off at regular intervals [illegible] top
of our parapet first from left to right and then back again from right to
left The intervals were very regular [illegible] it was thought by some on
this account that the gun was fired by machinery This gun was so
accurately trained and swung round that the bullets skimmed the top of
the parapet in places

Early—that is about 5 a m —next morning, May 27 1916 I awoke to
the shaking of the dug out by a [illegible] going off behind or in front of it
it was impossible to say which of the trench It was a small dug out for
two people and my fellow occupant Lieutenant J was peacefully snoring
above my head were two rats going through their morning ablutions
washing their faces and smoothing out their whiskers with their fore paws
That these animals were old and tried warriors was proved by the fact
that if I moved they hid behind the beam coming out again in a few
minutes if I remained quiet, but on the other hand the report of a bursting
grenade or the noise of a passing shell did not worry them in the least
One grenade burst so close to the entrance to the dug out that some of the
mud which it threw up fell on to the rug under which Lieutenant J
continued peacefully to snore but the rats only paused for a brief
second, patted the beam with their fore paws and shipped an expression
which said plainer than words " Say, that was a bit near, and then
carried on with their scratching I was fortunate enough to secure the
copper rod of this last grenade as it was only a few yards from the
dug out

My Trip down the Sap and below No Man's Land

Let me try and describe a sap as best I can One goes into a dug out
and sees what looks like the entrance to a well above which is a windlass
being wound up by two sappers Presently four dripping bags of blue
clay appear and are hauled aside taken off the hooks and put into a small
hand trolley and this when full is wheeled along my rails out of the
dug out and along the rear of the trench to a point where the bags are
taken out and made use of for building the lower portions of parapets
The rope and hooks are then returned to the bottom of the vertical shaft
of the sap and the hauling up commences afresh But there are yet
three other couples of men turning wheels and three smoke like pipes
curling over the edge of the sap and disappearing in the blackness below
advertise their functions One pipe is delivering fresh air to the extreme
end of the horizontal shaft below in which the sappers are digging their
way towards the enemy lines another pipe is sucking out the foul air,

[illegible] and the [illegible] meanwhile [illegible] well [illegible] bec[illegible] well k[illegible] [illegible] a great [illegible] then it [illegible] [illegible] more the [illegible] able that [illegible] necessary [illegible] of such [illegible] force pump. The shaft [illegible] one [illegible] le of [illegible] ungs were [illegible] such like the [illegible] The N C O barge was in [illegible] below [illegible] telephone [illegible] yesterday [illegible] tessmates, [illegible] down [illegible] and was [illegible] followed [illegible] light from the [illegible] greasy [illegible] of the sap that it [illegible] the lung [illegible] to half a [illegible] yellow light [illegible] hands and [illegible] 100 yards [illegible] reached [illegible] so much [illegible] we found half [illegible] the [illegible] reporting the reef [illegible] Nine Land with [illegible] of [illegible] with the foot. The [illegible] light and the [illegible] rake [illegible] construct a [illegible] scoop out [illegible] under [illegible] into space [illegible] outcrop [illegible] horizontal [illegible] But [illegible] means called for [illegible] to be detour [illegible] only effect would be a [illegible] last [illegible] the vertical shaft and [illegible] the du[illegible] the sap. All those [illegible] from the horizontal [illegible] the centre [illegible] again until [illegible] litter is completely [illegible]

[illegible] Adventure [illegible]

[illegible] was fortunate enough to witness a little contest [illegible] small fast Nieuport plane [illegible] a big [illegible] plane [illegible] Ill back near our position as I had probably escaped [illegible] 2,000 ft to take photographs. When [illegible] place was [illegible] towards the [illegible] the [illegible] British plane. The latter

was [illegible] The crack of exd[illegible] [illegible] dropped out in [illegible] white puffs which [illegible] the mech[illegible] and a bicycle. [illegible] two mechan[illegible] the non aeroplane [illegible] Bunch and Ge[illegible] forming then [illegible] the tufts of [illegible] red further to appear in the [illegible] Now we heard the [illegible] gun spit out its stuttering, [illegible] was no resp[illegible] an. Presumably they came [illegible] backwards. By the [illegible] were right over our heads [illegible] almost in vertical [illegible] apparently hung [illegible] the other. The axe [illegible] all the occupants had turned out and [illegible] every second [illegible] the German pl[illegible] leave. Suddenly some [illegible] out—Look out! [illegible] thirty two seconds with the exception of the seam[illegible] everyone had hurriedly dived for shelter. I [illegible] "Pippins" [illegible] heard a distinctly [illegible] that they were [illegible] grenades. [illegible] only fired one roller. Presently the [illegible] officer emerged [illegible] Serve us right! I've got killed by a pippin one of these days, he said. They've been the same thing every aeroplane light that has taken place anywhere near the lines. They know full well that the silly Englander with his instinctive love for the sport of a sporting [illegible] will be sure to be wed [illegible] they put with wait for the critical moment and then fire off a round of rifle grenades. We've seen two aeroplane duels from the trenches in the last month, a month ago a German plane was brought down well behind our lines and as it was actually falling through the air they fired grenades on it from over the way. But to return to the present affair. When it seemed that our man was right on top of the German he lurched over and—probably became he was getting too near the enemy lines—we could round and return to his own lines. The crews were two typical German aeroplanes around this district that used to fight overhead lately. The smaller one was armour plated below and in consequence was immediately known to the Tommies as "The Bullet Bill." The other much larger was usually only seen towards evening when it would soon unceremoniously up and down the German lines. Owing to the [illegible] with which these events, practically [illegible] received the sobriquet usually accorded to ladies of lax virtue.

Trench Routine Day and Night

Everyone admits that the German could take our trenches any day they wished to do so and the enemy would be equally ready to admit that we could occupy theirs. But in either case a counter attack if carried out by the ousted occupants on the same day would force the new occupants to retire. The counter attack must be immediate, however, as then one gets the new occupants at their maximum and integrity for they are in strange environment cut off from all communication with rear positions and chaos of necessity prevails. In twenty four hours, if left alone, they will have consolidated and co-ordinated, hence a counter attack to be a success must be immediate.

The telephonic arrangements for linking up the several regions of the

field of [illegible] organ [illegible] idea in Ohm [illegible] his finger tips day and [illegible] trenches But let me [illegible] out there It will be re[illegible] celebrated visit to shee[illegible] those much darker carbo[illegible] in a serious [illegible] over him Well on this o[illegible] His Majesty himself wished [illegible] the Queen They were [illegible] less than seven miles

Oh [illegible] ers and Primus stoves The [illegible] here we messed [illegible] breakfast, cold [illegible] hot [illegible] lunch [illegible] for there was [illegible] vegetables [illegible] anything most [illegible] really [illegible] But the wizard was [illegible] his [illegible] stove Down [illegible] wooden buttons to [illegible] weather, despite [illegible] pest One old whiskered [illegible] was who [illegible] three legs trailing the fourth [illegible] and useless behind [illegible] hero he was, by common consent, spared [illegible] turnip down in the lower and wetter trenches At night [illegible] and No Man's Land are lit up by the enemy's flare lights The [illegible] of two kinds star lights and punchinto lights the latter of [illegible] only being used when the wind was from the enemy towards [illegible] British trenches Men and officers are encouraged to cultivate the [illegible] spirit and to be constantly subjecting themselves to a process of introspection, to catechize themselves as if were so to whether they have done all they might have done during the day to further the war and bring nearer the cause for which they are fighting One of the questions that has given rise to some amusement is Am I as offensive as I ought be? On the night that we of the ships held most reluctant to bid good bye to our soldier comrades of the trench Captain G the company officer made a very nice and touching speech of farewell which I will not repeat here with the exception of his last few words and I may say that the offensive spirit of the naval party has exceeded even our expectations! The German is notoriously devoid of humour and is exquisitely sensitive to being made fun of He does not understand, never has understood Tommy Atkins with his inexplicable sense of humour amid the storm and stress of battle The sight of a little Belgian boy strutting up and down with a half turnip and the tail end of a carrot on the top of his head in imitation of a spiked helmet would send most Englishmen into fits of laughter it drives a German to murder The fact that our first batch of prisoners played football with a loaf of black bread they were given to eat has rankled more in the Hun's bosom than the naval blockade Hence with a foe of this somewhat stolid and unimaginative disposition the weapon of ridicule is not without its strategical value

On Ap[illegible] of our ne[illegible] over the Germ[illegible] dropped tw[illegible] the battlefield, [illegible] shaped object [illegible] football, and almost [illegible] is the immediate [illegible] of the Canadian who [illegible] to me—for [illegible] beyond the sphere of influence of what is apparently [illegible] type of devastating bomb. This is precisely what happened and when eventually the footballs did stop bouncing and Fritz's curiosity overcame his cautiousness he found written on them: Sorry bomb! April 1. Now, it may be said this is all very childish and silly but Fritz is sadly puzzled that very day it may be, he has heard ominous whispers of food riots in Berlin whereas from the official accounts he has been in the habit of receiving it is London that should be the scene of such riots. And so he goes through mental torments in his futile efforts to adjust his conception of the relative situation conformable to what he is told and to what he sees and hears. How is he to reconcile his Government's assuring bulletins with the persistent rumours of famine riots in his capital? How is it possible for his enemies to be so light hearted and indulge in such drolleries as that he has just witnessed when their metropolis has been burnt to the ground and their fleet utterly and for ever vanquished?

(To be continued.)

Clinical and Practical Notes.

NOTES ON THE EFFECTS PRODUCED BY A SUBMARINE MINE EXPLOSION

By Fleet Surgeon W. L. Mathew, R.N.

In August 1916, one of H.M. auxiliary ships was torpedoed by a German submarine and sank stern first in about fifteen minutes.

When the ship sank the majority of the crew had abandoned her, some in boats, others swimming or clinging to flotsam. One boat, however, on the starboard side with a double crew had failed to get clear and was overturned and drawn down by the vortex. The officer in charge of the boat and such of the crew as were saved felt themselves driven upwards towards the surface by the force of a mine explosion. Although they must have been almost vertically over the mine and not much more than 10 feet from it when it exploded, none of them felt any ill effects.

The effect produced by the mine explosion upon the men in the water at different distances astern of the ship and in the majority of cases, further from the exploding charge than the boat referred to, was marked. In varying degrees they all experienced the sensation of a violent blow upon the immersed parts of the body, and several became temporarily unconscious. The occurrence took place at about 8 a.m., and the survivors were received on board the hospital ship "Soudan" at 12 noon.

Ten cases presented symptoms much in common and gave a history of haemorrhage from the nose and ears. After having been picked up two passed blood stained urine, two blood per rectum, and eight had haemoptysis. On admission to the hospital ship there was a rise of temperature in seven cases, transient in the majority and probably due to shock. All had more or less acute abdominal tenderness, and (with the exception of a private R.M.L.I. who at the time of the explosion was being lifted into a boat and immersed only to the waist) complained of a sense of constriction about the chest. One officer had retention of urine. These symptoms passed off in three or four days, except in three men whose cases are given below.

J. H., an A.B., R.N.V.R., was in the water some distance astern of the ship when the explosion took place. He felt a blow distinctly over the whole body. After being taken out of the water he spat up blood, and passed blood stained motions. His temperature on admission was subnormal, there was tenderness over the abdomen, and the recti were rigid. The temperature rose for the first three nights and on the fourth day he began to pass three to four dark tar coloured motions daily and had pain after micturition. These symptoms passed off after eleven days treatment and two days later he was discharged to his depot ship for passage south.

W. W., an A.B., R.N.R., was clinging to a spar about 100 yards astern at the time of the explosion. Blood poured from his nose and he became unconscious and did not completely recover until lifted into a boat. He spat up a quantity of bright blood and passed pure blood per rectum. He was still suffering from haemoptysis on admission and was passing

[illegible] His temperature rose and remained [illegible] there was abdominal rigidity, with slight dul[illegible] [illegible] Forty eight hours afterwards diarrhœa [illegible] strict dosing to defæcate He had difficulty in [illegible] on one occasion required a catheter The urine [illegible] quantity of a hazy and dark grey in colour He was [illegible] discharged to the hospital train at Leith after eight [illegible]

[illegible] estimated he was in the water about 130 yards from [illegible] still visible when the explosion occurred He felt [illegible] coughed up a quantity of blood On admission the [illegible] and very small and temperature subnormal He complained [illegible] over the epigastric region, and the abdomen was rigid [illegible] on palpation He was still expectorating blood-stained sp[illegible] H[illegible] loped abdominal distension probably from ileus, the percussion [illegible] resonant throughout with no dullness to be detected in the [illegible] he complained of pain and tenderness in the right iliac [illegible] On the 28th diarrhœa set in with tenesmus of lower bowel [illegible] but passage of dark liquid motions There was pain at every [illegible] His temperature rose slightly elevated course [illegible] abdominal symptoms had passed off the motions [illegible] and he was steadily improving when discharged to hospital train eighteen days subsequent

It is strange that those closest to the mine but more immediately over it should have [illegible] effects less than the men in the water at a greater distance In the latter case there was probably little weight (head) of water over them while in the latter the thrust reached them in a more horizontal direction and they were violently compressed in the unyielding flank Hæmorrhage must have taken place from the pulmonary capillaries intestinal and vesical mucous membrane and into the peritoneal cavity itself

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NOTES OF THREE CASES OF CHRONIC INTERSTITIAL MASTITIS IN THE MALE

By Fleet Surgeon Kennedy H. Jones, M.D., R.N.

In view of the comparative rarity of mastitis in the male the following cases are placed on record —

Case 1.—Boy aged 16 This boy came into the sick bay and exhibited a well marked enlargement of the left breast which was fairly prominent and drooping and about four times as large as the right On palpation there was a good deal of tenderness and many thick and tortuous and small but hard nodular masses could be made out in the substance of the gland The condition of the right breast was normal

The condition had been noticed by the patient for several days but had not caused him very serious inconvenience The mass was kept under observation and the tenderness gradually disappeared but the swelling the thickened trabeculæ and the nodular masses underwent little or no change The patient was under observation for seven months and during that time he had one recrudescence of the trouble in

a semi acute form which lasted about [illegible] months but did not prevent him from doing a certain amount of work.

His wife of a most unstable and [illegible] temperament and eventually he left the ship under observation for mental disease having threatened to commit suicide. At this time [illegible] was well marked.

Case 2.—A stoker, aged 24. While in the sick bay and whilst undergoing a physical examination for another reason this man was observed to present a well marked enlargement of his right breast. He could give no definite account of the initial phases in the alteration in size and appearance of his right breast but stated that the enlarged part had previously been tender and that it had subsequently become normal in feeling if not in aspect. A physical examination demonstrated a condition precisely analogous to that of the preceding case, thickened trabeculæ and nodular masses were present with a general overgrowth of the part.

He suffered no inconvenience, made no complaint, and left the ship soon afterwards and was lost sight of.

Case 3.—A stoker, aged 21. This man came to the sick bay with a very well marked enlargement of the left breast and with a definite history of the trouble having begun during or shortly after, a heavy coal ship the previous day. A careful examination of the part demonstrated that it was in precisely the same condition of sub acute mastitis as the other two cases recorded above. The man was kept under observation for several months and the more acute symptoms and to a much less extent the accompanying signs of inflammation gradually decreased.

As in the first case severe exertion induced something resembling a recrudescence of the more acute symptoms. The breast affected remains permanently enlarged to perhaps three times the size of the other and thickened trabeculæ and nodular masses are easily demonstrable in its substance.

Treatment.—In the most acute stages of these cases it was necessary to restrict to some extent the use of the arm on the affected side. Belladonna locally and generally was exhibited and so was iodide of potash, but nothing seemed to have any noticeable effect on the condition which was characterised by its chronicity.

Remarks.—No predisposing factor could be found in any of the three cases, and in one only was an exciting cause suggested. Although one case was neurotic the other two were quite normal. These cases were asymmetrical whereas when this condition occurs as it so commonly does in women and girls it is almost always symmetrical.

The cases were very chronic and showed not the least inclination to go on to suppuration. Unlike the same condition obtaining in the female, there were no reasons whatever for supposing that it was in any way associated with the sexual functions.

A FULMINATING APPENDICULAR ABSCESS AT SEA

By Staff Surgeon R. H. McGillin, M.B., R.N.

This interesting and instructive case is recorded on account of the concealed nature of the disease and the results from a post operation.

An Officer aged 54 reported himself to the Medical Officer on March 8, complaining of feeling generally "out of sorts." His main symptom was loss of appetite with no relish for the food supplied in his mess. No pain was complained of. Two days later he complained of pain in the gastric region after partaking of any food. The abdomen was examined but found normal. The abdominal walls moved freely. There was no rigidity or pain on deep pressure in any area and his bowels were normal. Temperature was 98.8° F., and the case was thought to be a gastritis and treated as such. From the 10th to the 14th inst., patient continued at duty but did not regain his appetite and on the evening of the 14th turned in as he did not feel so well. Temperature was normal.

On March 14 I joined the ship as Senior Medical Officer and three hours after joining sailed for a twelve days cruise with no chance of being able to send any case to hospital.

The next morning 9 a.m., the Surgeon asked me to see this case, and on examination I found a large well defined mass in the right iliac fossa extending upwards and inwards to a spot about midway between McBurney's point and the costal margin. The mass could not be felt *per rectum*. His bowels were normal. There was no rigidity of abdominal walls and only slight tenderness was complained of on pressure over the upper and inner edge of this mass. Tongue was slightly furred and there was no history of vomiting except that once or twice during the morning gastric contents regurgitated. At 10 a.m. patient's temperature had risen to 101.1° F. and his pulse increased to 90. He looked very ill and as the case was rapidly progressive and no port available for twenty four hours I decided that immediate operation was necessary.

Permission was obtained to use the captain's lone cabin where under the skylight the operating table was placed and in one hour from deciding to operate the patient was on the table and everything ready to begin. Under $CHCl_3$ and ether (administered by the Surgeon) nitrous oxide was produced. Assisted by the sick berth steward, I opened the abdominal cavity by the iliac incision (4 in. in length and central point 1 in. internal to anterior superior iliac spine). The peritoneum was found to be thickened and adherent to the caecum. After enlarging the incision and following the peritoneum downwards I was enabled to find a small area which I could pick up. This I opened and with very gentle manipulation managed to free the peritoneum from the caecum for about 2 in. On exploring with the finger (no gloves had been supplied to the ship), the appendix was discovered bound down to the caecum and running upwards and inwards under the colon which was also bound down posteriorly forming one large mass. With great difficulty I separated as much of the caecum posteriorly from the peritoneum as possible in order to obtain a better view and found the appendix swollen and hard running up into this pocket. After plugging the anterior

opening into the abdominal cavity the abscess was opened and a gush of purulent fluid escaped. This cavity was washed out and a large rubber drainage tube was inserted. This was stitched to the skin and was dressed, leaving it open. The patient was removed to the captain's fore sleeping cabin and a constant watch kept.

Progress.—There was no post-anæsthetic sickness. A four-hourly record of temperature showed that his temperature rose until 8 p.m. when it was 102·4° F., pulse 88, respiration 20; at midnight temperature was 100·2° F., pulse 82; the temperature dropped to 99° F. before removal to hospital. In hospital his temperature remained at or about 99° F. for two days, when it came down to normal. On March 18 the abscess continued to discharge freely but the patient improved daily. On March 27 the tube was removed and all that remains now on April 6 is a small sinus, ½ in. in length, discharging very slightly.

Commentary on the Case.—Patient was given an enema before operation, and after shaving the pubis an iodine liniment was applied to the skin. Dressings were sterilized in the apparatus provided, but owing to its small capacity swabs were made from aseptic wool which had been steeped in 1 in 20 carbolic and before use these were wrung out in normal saline. Horsehair and sutures were boiled, as also the instruments. Rubber gloves were not obtainable and their absence was greatly felt. Pituitary extract would have been invaluable in the after-treatment of this case. If the appendix could have been removed the lack of finer silk sutures and silkworm gut would have made the operation more difficult.

A METHOD OF REMOVING ADHERENT DRESSINGS

By A. DE STAIN, SURGEON, A. VAVASOUR ELDER, DENVER.

To remove an adherent dressing of any kind quite painlessly and without setting up hæmorrhage from the granulating surface the following method will be found most satisfactory.

The dressing is first thoroughly moistened with water—preferably sterilized. A syringe filled with an equal part solution of hydrogen peroxide (10 vols.) and water is then drawn along one edge of the dressing, the fluid being slowly expelled from the syringe in the meantime.

On coming into contact with the dressing the peroxide solution is decomposed and the dressing is lifted up on the bubbles of gas. The edge of the dressing thus released is raised with forceps and the process repeated until finally the whole has been removed. The advantages of this method are:—

(1) Machine painlessness and consequent absence of shock or inconvenience to the patient.

(2) There is no hæmorrhage from the granulating tissue to cause adherence of the subsequent dressing, as the lifting process is gradual and gentle.

The drawback is the time taken in removing the dressing which is considerably longer than by the ordinary method of moistening and then dragging the dressing off. This however is not worth considering under ordinary routine conditions in hospital.

The effect [illegible] peroxide solution [illegible] previously [illegible] dressing [illegible] in the event of a rub or [illegible] it is not anticipated [illegible] some good results would be obtained in the cushion of [illegible] in lieu the dressing which lifts it up would not be formed

This method naturally is not applicable to aseptic cases as the peroxide solution is not decomposed to the same extent An ordinary nasal douche [illegible] with a 4 oz rubber bulb is a most convenient form of container for the solution

—

TWO CASES OF FUNCTIONAL APHONIA

By Temporary Surgeon MICHAEL MASTO MB PROSEC RN
Royal Naval Hospital Haslar

During peace time it was not unusual to meet with cases of so called functional aphonia The form of laryngeal paralysis was however in the large majority of cases confined to young females and more rarely to males of unstable nervous temperament

During the unprecedented nerve racking experience of this war however it was found that even healthy adult men under severe mental and physical stress were not immune from this form of neurosis

The following two cases are of interest from many points of view In Case I we have a healthy man of perfectly sound antecedents struck dumb under the influence of shock whilst carrying out such duties as might fall to the lot of any naval rating working in the engine room in times of peace Case 2 deals with a man who became aphonic under conditions indirectly assimilable to the effects of little shock

In the first case the type of aphonia was the commonest form in which the patient although unable to phonate, was yet able to make himself understood by speaking in a whisper The condition of the second case was one of aggravated functional aphonia combined with paresis of the whole speech mechanism known as functional anarsia or apsithyria Both cases proved very resistant to treatment and both eventually recovered although the methods adopted which resulted in the eventual restoration of speech were different In both cases there is no doubt that suggestion played an important part in reinforcing the will power of the patient and in preparing the ground for the ultimate shock which was to produce speech The process of conversion of silence into speech might be likened to that of a cyclist climbing up a gradient where nearly all the effort comes from the index and where all that the surgeon is required to do is to give the final push which will enable the cyclist to top the crest and sail down the slope on the other side According to the degree of the shock and the stability of the sufferer's nervous mechanism so must the surgeon wait a longer or a shorter time before his push may become effective

It would seem that in the cases quoted below this push was made either too roughly or too soon The result being a certain amount of physical anguish to the patient with no corresponding advance toward recovery

I feel sure that in many cases the patient would reach his goal unaided—

some temporary emotional character, such as we are constantly meeting with in our daily lives, affecting the patient's receptive system and providing the adequate stimulus. It would be said of him that he had recovered his voice spontaneously.

In both those cases, electrical and mechanical stimulation of the upper air passages had been tried many times without effect. It has been stated above that suggestion probably plays an important rôle in the treatment of this condition. Case 1 is an example of how anæsthesia combined with stimulation may succeed where stimulation alone has failed. Indeed cases have been recorded where patients have recovered their speech under the influence of alcoholic intoxication. Whether this recovery was spontaneous or effected as a result of some physical stimulus I do not remember to have seen stated. In addition to the numerous methods in daily use for influencing the patient by suggestion it is conceivable that the following case might prove effective. In a base hospital where many faces are unknown the services of a few would be sphemera might be secured who in the presence of the true aphonic would regain the voice which they had never lost. Finally, both these patients showed how genuine was their complaint by the intense jubilation and gratitude they displayed when the lost function had been restored.

Case I.—A mechanician this patient was admitted to Haslar on July 18, 1916, with the following history. On June 1, 1916, he was sitting a valve in the bilge of engine room; steam was put on the starting engine and the drains were opened out. Patient immediately bathed in steam and some of it entered his throat. He immediately rushed up gasping to the engine room platform and was unable to speak. It would appear that patient's condition was at first regarded in his ship as one of œdema of the larynx but apart from a slight rawness of the throat, which soon passed away, and from his inability to speak patient had no other complaint. On July 5 he was discharged to hospital ship Plassy, and there received seven applications of the faradic current, which caused the patient severe pain without his regaining his voice.

On admission to Haslar patient was found to be a healthy looking man aged 38 of excellent physique. There were no signs of any organic disease. He was unable to utter a spoken word but could whisper well and enough fairly loudly. On the day after admission, a laryngoscopic examination was made and the vocal cords and larynx appeared normal. On attempting to vocalize the adduction of the cord could not be completely effected and no sound was produced. On getting patient to cough, however, the cords would for a brief moment be seen to approximate in a normal manner.

It was decided to keep patient in the ward and with rest, tonic treatment and by constantly assuring patient that he would soon regain his voice, it was hoped that the next effort might be more successful. About ten days after admission another laryngoscopic examination was made with mild mechanical stimulation of the upper air passage. This time although no sound was emitted patient informed me that he had never been so near being able to speak before. It was next decided to try the effect of mechanical laryngeal stimulation when the patient was recovering from the effects of anæsthesia. Accordingly the patient was informed that his muscle of talking was to be replaced and that

upon his help depended the success of the operation He was recommended to shout out as soon as he became conscious of my working inside his throat

I administered open ether, getting the patient lightly into the second stage As soon as signs of consciousness began to return the laryngeal mirror was placed lightly on to the larynx and the patient commanded and encouraged to count out loud and shout The result was completely successful, and the patient was seen on August 30 and found to be speaking normally

Case 2—A leading stoker, aged 25 this patient was admitted to Haslar with the following history He was in a destroyer in the Jutland battle and a shell exploded on deck He was blown into the sea by the concussion of the shell, picked up and taken on board His behaviour on board was apparently abnormal He had delusions that he was being watched and his manner was nervous with twitching of the fingers and a halting speech As he was unfit for duty he was discharged to Queenslerry Hospital for treatment on June 23

On the day after admission patient lost his voice The twitching of his arms continued There is no record of treatment having been carried out during his stay

On admission to Haslar on June 29, patient was found to be a healthy looking man, aged 25 He had no recollection of his stay at Queenslerry and did not know how he had lost his voice His behaviour was perfectly rational, and apart from his tremulousness and inability to speak there was nothing abnormal about his condition However in view of the history of mental derangement he was warded in the mental block.

On examination there were no signs of any organic disease

During the whole of his stay at Haslar, except on one or two brief occasions when he was faintly heard to whisper 'Yes' and 'No' until his final care, patient has not been able to utter a sound either in spoken or whispered conversation

After a week's stay in the mental block patient was transferred to a general ward Both internal and external applications to the larynx of the electrode of a faradic current had failed to produce speech On one occasion very light ether anæsthesia with stimulation of the larynx by electricity had been carried out without effect I saw patient for the first time on July 27 twenty eight days after admission He was quite unable to whisper On examination of the larynx the cords were seen to be quite healthy but held in wide abduction On the patient making an attempt to phonate they would be slightly adducted and then immediately spring apart again Nevertheless after assuring the patient that the cause of his trouble was perfectly obvious he became very excited and seemed anxious that I should proceed as soon as possible At the next examination the mirror was pushed down on to the larynx and the patient commanded to say "Ah!" This he did loudly and his speech returned I saw the patient again on August 25 He speaks clearly but jerkily, and his general nervous condition is such as to justify him being put in for survey

I am indebted to Temporary Surgeon Hildred Carlill R N for his notes on the above case

NOTES ON A SUCCESSFUL CASE OF TREATMENT BY SUGGESTION

By Fleet Surgeon HUGH S BURNISTON M.B., R N

These notes may prove of interest to any medical officers who are trying this method of treatment for the many varieties of nervous trouble resulting from the War The only other excuse for recording this case is the extraordinarily rapid result of the treatment

The notes are divided into three parts (i) Those kindly sent me by Surgeon Dermot Loughlin of the Royal Marine Infirmary Deal (ii) a short description of the treatment adopted and its result on July 7 (iii) what happened when I saw the man again on July 13

I

A stoker aged 26 On May 22, while his ship was at sea, this man was found in a workshop hidden behind some oil drums and refusing to come out The Medical Officer describes him as dazed not recognizing his messmates suspicious of people with whom he came in contact, and complaining of headache He was discharged to the Royal Naval Hospital St Malo the same day and was received by us on May 24

His physical condition was normal except for rather glib knee jerks To all questions he answered Don t know and shook his head He improved considerably in the next two or three weeks and could answer questions concerning events that had happened since his admission quite rationally He complained at intervals of headache or of a sense of weight in the head A Wassermann test was negative On June 26 I examined him for the first time He said that he had no recollection of anything at all before the hospital at Malo but could remember everything that had happened since He did not know the names of the commonest objects unless he had seen them in the ward or grounds When taken into the boiler house he did not know the name or use of a lineman spanner or pressure gauge but could describe the latter as being made of brass and glass because he said he had seen articles of both substances in the wards He could read and write well but a great many words conveyed no meaning to him He had no conception of the interior of a ship He said he was anxious to return to the Service if he could be of any use His only physical symptom was a feeling of pressure in the head but he appeared anxious and rather depressed as to his mental condition and prospects His condition remained unchanged until his discharge from hospital on July 6

(Signed) Dermot Loughlin
Surgeon

II

This stoker came to the sick bay at the Royal Naval Barracks Chatham on the forenoon of July 7, bringing with him a note saying briefly what is included in the above and recommending that he should be retrained as a stoker

The mental condition was as follows Physically he was quite normal a well set up man his voice was however monotonous and he looked worried did not know if he had any relations though he stated that a certain person had been to see him who said she was his wife There

was no doubt whatever as to [illegible] ness of the mind condition When asked how he knew [illegible] he said it was on his card could not account for the fact [illegible] could read and write and would undergo any treatment to get well [illegible] In the presence of Fleet Surgeon Mormement the patient [illegible] into the hypnotic state induced by gazing at the brass knob of the [illegible] which is generally used Patient went off easily was then [illegible] to sleep and that there was nothing for him to worry about [illegible] then taken back to the time his illness began and told he could [illegible] what had happened previously he was then asked to say where he joined his ship and what had happened up to date which he [illegible] pressing surprise at having been in the sick bay before going to Malta [illegible] He stated that the trouble was caused by the explosion of bombs from air craft and that after one explosion very close to him he had lost his memory Asked if he was married, he said yes and had [illegible] 1 year and 9 months old While describing the falling of the bombs he looked very worried and I was afraid he would come out of the sleep so put him deeper though at no time was he in the deep hypnotic sleep He was now told that when he wakened up he would remember all that had happened and then ordered to wake up For a few moments he was dazed and then in reply to a question said he was all right When asked if he was married, he said "of course" and that he had a child He remembered everything perfectly both previous to and since his illness including his efforts to learn while at Deal

On the following morning he went on four days' leave with orders to report on his return

III

On July 13 the patient reported himself in the sick bay stated he was quite well and able to remember everything and had been quite well while on leave but was only troubled by a headache which he had suffered from ever since he could remember and which was the result of a fall when a child — so he had been told Thinking it worth while to follow the case out he was again put into the hypnotic state and asked if he could remember the accident which caused his headache he replied — no He was then as it were conducted back through the years and again asked if he could remember He at once described a white house in India mentioning the name of the town and how he fell down the area, saying he saw blank people in white clothes and that his head was cut and bleeding The patient was now told that he would have no more of these headaches and that when he wakened he would be perfectly well He was then told to awake, and on being questioned said his headache was gone, and repeated the story of how the accident had happened

July 20 — Patient states he has been free from headaches since July 13 and is perfectly well August 2, patient states that he feels better than he ever felt in his life having got rid of his chronic headache September 1, perfectly well drafted to a sea going ship

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AN OUTBREAK OF MEASLES IN H.M.S. "TIGER"

By Fleet Surgeon JOHN B. MUIR, R.N.

An epidemic of measles attacked the ship's company of H.M.S. "Tiger" during the months of March and April 1916 and as will be seen on reference to the table appended there was a total of twenty-four cases, sharply divided into two series. The first series lasted from March 15 to 29, with fourteen cases and the second series—evidently the result of infection by the first—from March 30 to April 8, with ten cases.

Source of Infection.—By a process of exclusion one can be fairly certain that the disease was brought on board by civilian workmen, but this cannot be definitely proved. The men attacked in the first series of cases were widely separated, both by their messes and duties, and no common employment or amusement as a possible source of infection could be traced. At first it was thought that the landing parties or the landing room (in which shore workmen were occasionally massed) might be at fault, but some of the first series, from which alone the source of contagion can be argued, never used the landing room and many of them never went ashore at all. Friendly or working intercourse with the civilian workmen was common to all the ratings on board, as they used the same smoking and recreation spaces and their duties brought them in contact with all kinds of ratings. There were plenty of opportunities of being infected from the shore as the disease was rife in the villages around our base. There was a certain number of shore workmen employed on board the ship when the epidemic broke out, but all of them denied recent exposure to the disease. As the infection had taken place at least ten or twelve days before the disease was recognized, and as the shore workmen on board were pretty frequently changed, it is possible that the source may not have been on board when these men were questioned. At the same time there was also a certain number of some hundred other ships in the Firth, but infection from them was very unlikely as the quarantine regulations were very strict and there was very little communication between the ships.

Incidence of the Disease.—It will be noted from the table how scattered the epidemic was—in fact it would have been impossible to separate them more effectually if one had tried. In only two messes, No. 35 boys and No. 14, stokers, was there more than one case. In No. 35 mess the three cases came from separate tables. In the second series attention is called to the fact that in only three messes was there a recurrence of the disease, which speaks well for the efficiency of the isolation and disinfection routine which was carried out.

Type of the Disease.—In ten cases of the first series and seven of the second the disease was typical measles with symptoms of marked coryza, roseolar crescentic rash first appearing round about the roots of the hair, face and neck, moderate temperature and slight general disturbance. In the remaining cases the suboccipital glands were enlarged and the coryza and general disturbance were not such marked symptoms, the whole affection being much milder. These may have been cases of rubella, but no attempt at differential diagnosis was made. Except in one case in which the temperature was 103° F. when he left the ship, none of the cases was of a severe type and there were no complications such as pneumonia, &c.

Number of Mess	1	1	13	14	[illegible]	[illegible]	[illegible]	[illegible]	7	38	45	21	[illegible]	3	9	1	[illegible]	1	—
Hull	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remarks
March 15	—			—						1				—					First series
16			1	1			1			—	—							—	14 cases
17	—	—		1	—				1				—			—		1	Ship placed in state of quarantine
18	—		—					—				1	1					—	—
19	—	—			1		1	—				—	—	—				—	—
20		1												—					—
March 30				—												1	—		Second series
31						—					—						1		10 cases
April 1														1					Quarantine period expires on Apr 1
		1						1	—	—						—			
4	1					—													—
4								—		1		—							—
											1		—				—		—
8				—				1							1			—	
Total	1		1	—	1	1			1	3	1	1		1	1	1	1	1	Total 14 cases

General Pr[illegible] — [illegible] taken in dealing with the epidemic [illegible], but [illegible] that the possibility of their being effective depends [illegible] the thoroughness with which they are carried out —

(1) Immediately after the fourth or the second day the ship's company was mustered and medically inspected

(2) The men were warned in a speech by the Captain of the first symptoms of the disease and ordered to report themselves at the sick bay at once if they should suffer from colds fever slight or any kind of skin rash

(3) As many of the men as could be mustered without seriously interfering with the work of the ship were mustered at divisions and inspected daily and medically inspected for fourteen days

(4) Bedding and hammocks were aired as frequently as the weather and ship's duties allowed

(5) More stringent precautions were taken during ventilation rounds to see that fans were running and that the trunks had not been tampered with All natural means of ventilation were utilized to the utmost Hot air was ordered from 9 30 to 11 a m in order to thoroughly dry and warm the mess decks

(6) Whenever it was possible the mess decks were scrubbed more frequently and wiped over with izal

(7) All dockyard workmen employed on board were closely interrogated as to the possibility of their having been recently exposed to the risk of infection

(8) Cases attacked with the disease were rigidly isolated and discharged to hospital at the first opportunity

Precautions taken in Infected Ships —

(1) Every effort was made at the early diagnosis of any subsequent cases

(2) The mess was mustered daily for medical inspection for fourteen days from the date of last exposure to infection

(3) Ratings in the mess who had been in contact with cases came to the sick bay where they got an izal bath and dressed in clean clothes All their other clothes were passed through the disinfector

(4) All hammocks and bedding were passed through the disinfector

(5) Mess places were scrubbed out with strong izal solution including mess stools tables and mess traps immediately after detection of case Subsequently the mess place was sluiced with izal daily after the usual wash down

(6) Lockers belonging to infected cases were emptied and all gear sent with the case to hospital The locker was sterilized with izal

Apparently these precautions were completely successful and it is satisfactory that in a ship's company of whom much the larger proportion is under the age of 20 years the second series only consisted of two cases Unfortunately in the average measles case has his most infectious period for at least a couple of days before the disease is likely to be recognized a second series of cases is inevitable but it lies in the hands of the medical officer I think to make sure that the second series is as limited as possible and that there is practically no third series The biggest danger of all is an ambulant case, and only very careful inspection of the ship's company can avert that risk

[illegible] MOCOCCAL MENINGITIS [illegible] STORES [illegible] SHAND RN

[illegible] the practice of this hospital [illegible] cases of cerebro spinal fever are [illegible] up in the [illegible] to the first that recovery was apparently complete [illegible] disease (*see* Allbutt and Rolleston s System of Medicine

The h[illegible] in connection with the case was carried out by Tempo[illegible] Gimblett

A drie[illegible] Naval Division was admitted on April 9 with the follow[illegible] had been under observation at the camp for five days [illegible] headache and pyrexia the temperature varying from 100° F [illegible] On the morning of the 9th he vomited several times and appe[illegible] very drowsy For the first time he complained that his eyesight [illegible] so good as a week ago His tongue was dry and furred—pulse [illegible] On the abdomen are several rose spots He resists strongly any attempt to elicit Kerning s sign The case presents features of enteric and tuberculous meningitis but is more like enteric

On admission he stated that he had had a sore throat shortness of breath, and a morning cough for several weeks He complained of mild pain and stiffness in the legs The knees were kept flexed and rigidity Kerning s sign was elicited Head retraction was marked Several spots were to be seen on the abdomen but there is no rash characteristic There was no choke in either optic disc His mental condition was clear and he answered questions readily Temperature 102 6 F pulse 88 respiration 24 He coughed up a little tenacious blood stained sputum but no abnormal signs were discovered in his chest His bowels had been opened He was isolated A lumbar puncture was done Cerebro spinal fluid was under considerable tension and was turbid 30 c c were drawn off Twenty c c of Flexner s polyvalent anti meningococcic serum were injected The findings of the cerebro spinal fluid were as follows —

(1) On staining a centrifuged specimen with Leishman s stain many polymorphonuclear cells were seen but few organisms and those which were present were Gram positive (2) No tubercle bacilli were present (3) No growth occurred on Nasgar s medium The culture was kept in the dark and placed in a bath at 37 C immediately after taking until it was transferred to the incubator This culture was not made from centrifugalized fluid

He was given calomel 5 gr and ordered a mixture of urotropin and acid sodium phosp That evening he felt better Temperature 100 4° F pulse 88 On the following morning Kerning s sign was absent—neck was still stiff but headache less Patient s mental condition was good He had a slight cough and some tenacious sputum which was found to contain a large number of Gram positive diplococci

Widal s test was negative in dilutions of 1 in 40 and 1 in 100 He had never been inoculated On April 11 a lumbar puncture was again done, more for diagnostic purposes The fluid was not under tension and was quite clear

(1) With Leishman s stain a smaller number of polymorphs and about the same number of Gram positive diplococci, which were extra cellular

(2) A culture [illegible] on centrifugal [illegible] on trypsin broth [illegible] leguminosa agar. A [illegible] with of Gram [illegible] lanceolate diplococci was obtained after [illegible] hours. A Widal test was again negative.

Temperature [illegible] all symptoms subsided. Knee jerks returned on April 26 a [illegible] and their normal strength. A throat swab showed only Gram [illegible] diplococci. He was discharged from hospital on April [illegible] apparently quite well.

NOTES ON A CASE OF REDUCIBLE EXOPHTHALMOS

By Lieut. Surgeon [illegible] Hollins, R.N.

Fig. 1. Normal [illegible]

THE accompanying photographs illustrate a case of reducible exophthalmos recently under treatment on board. The patient, a stoker petty officer, aged 38, could produce the phenomenon at will, and by gentle manipulation could reduce it.

He first attracted my [illegible] one morning, at Sunday [illegible] his anæmic and somewhat [illegible] appearance and by the [illegible] of his infra-orbital vein During a subsequent conversation he told me he could make his eye come out of its socket whenever he chose and humorously added that he frequently performed this feat for the edification of his shipmates Noting my look of incredulity he thereupon bent

Fig 2 R[illegible] [illegible] x photo b[illegible]

his head down between his knees and after a few seconds presented a typical exophthalmos of the right eye A few deft touches with his fingers and the eye was replaced in its socket

His history was that eight years ago he had contracted a severe attack of syphilis accompanied by a considerable loss of flesh to such an extent that at one period he only weighed 88 lbs —his normal weight being about 10 stone Six years later he became aware of this peculiar

obstruct[illegible] No [illegible] or inconvenience resulting be had [illegible] without reporting it

Vision [illegible], and ophthalmoscopic examination revealed normal fundi [illegible] was no evidence of any intra cranial or orbital tumour No [illegible] could be felt over the eye and no bruit heard on auscultation [illegible] which might have suggested an orbital aneurysm or an arter[illegible] anastomosis The other cardinal symptoms of exophthalmic [illegible] were absent, and there were no manifestations present indicat[illegible] [illegible]vation in the normal secretions of the thyroid

The affection was presumed to be the result of absorption of the orbital fat with [illegible] of fluid which gravitated into the back of the orbit through the sphenoidal or spheno maxillary fissure probably the result of a specific lesion The diagnosis was confirmed after making an exploratory incision through the nostril, with an Hard's sound, when a small quantity of dark coloured muco purulent material escaped

The treatment consisted in restricting the movements of the eye by means of a small eyeshading truss, the internal administration of potassium iodide and intramuscular injections of calomel cream

By the end of the fourth week the specific lesion had apparently been entirely absorbed as the exophthalmic condition could no longer be produced

I am indebted to Capitano Medico Lanzillotti oculist to Ospedale della Croce Rossa Italiana for performing the rhino exploratory operation

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NOTES ON A CASE OF ERYTHEMA INDURATUM SCROFULOSORUM

By Staff Surgeon T B SHAW M B R N

As this skin affection, sometimes known as Bazin's disease is comparatively rare the following account of a case recently under treatment in H M S "Falmouth" may prove of interest

The patient a Chief Petty Officer aged 36 complained on January 30, 1916 of boils on the back of the right thigh These he stated had been present for some days, but he took no notice of them as he thought they would soon disappear

Previous History —About eighteen months ago he complained of cough and loss in weight Nothing definite then could be found in the lungs and examination of the sputum was negative He is naturally thin, his usual weight being about 138 lbs Two sisters and one brother died of consumption There was no history or sign of venereal disease

He was kept under observation and under treatment with cod liver I gained in weight, and remained fit and well until he complained of the boils

On examination two septic ulcers each about the size of a shilling were seen on the back of the right thigh disposed horizontally about two inches below the gluteal fold Their bases were foul their edges a little raised, red and inflamed Clinically they appeared to be just two foul sores following boils which had burst and been neglected

Boric fomentations were ordered thrice daily A week later there

[illegible] no signs of healing, the ulcers [illegible] was now ordered twice daily [illegible] improvement

On February 20 the ulcers were [illegible] circular inflamed areas had now developed in the [illegible] lower borders of each ulcer

The condition was now thought to be tuberculous and [illegible] boric fomentations were tried The lesions however remained [illegible] and showed little improvement

On February 26 patient complained of small lumps in the thigh near the ulcers He had noticed these a few days ago and now stated that he had felt small lumps before the old sores came On inspection nothing could be seen except a slight violet discoloration of the skin to the inner side of the ulcers On palpation an indurated band ¾ in broad and 14 in long could be felt extending horizontally inwards from the edge of the internal ulcer To the inner side of this band, and extending it as it were horizontally inwards to 2¼ in were several definite nodules varying in size These were oval in shape, the largest being about the size of an almond They were freely movable under the skin and in size and consistency resembled very closely lymphatic glands There was no tenderness on pressure

It was evident now that we were dealing with a case of erythema induratum scrofulosorum a skin affection first described by Bazin, and characterized by the formation, usually on the backs of the legs or thighs of chronic inflammatory subcutaneous nodules which tend to coalesce and form bands of induration, and later break down and form ulcers

Syphilis could be absolutely excluded in this case and at no time did the ulcers at all resemble those due to specific disease The patient was sent to hospital on March 1 The disease is said to occur more frequently in those whose occupation entails much standing This causative factor was present in this case the patient, a signal thing having to spend long hours daily on his feet on the bridge

Two types of the disease are sometimes described a tuberculous and non tuberculous From the history of this case it is almost certainly of the former variety

Extracts from Official Journals.

Deputy Surgeon General W. J. Collopy writes with regard to the Operating Room on board —

The Room is a fine large and commodious compartment. It is tiled and has good light and ventilation by side scuttles. It was found however by practical experience whilst operating with the ship rolling that the tiles are slippery and that one is in constant fear of falling. I consider that corticene with a covering of shellac would meet the case, for although a tiled floor may be necessary where the room is in constant use in a man of war where it is only used occasionally it does not seem necessary. Moreover it is very cold so that the room cannot be used as an emergency ward. The operating table has been placed in slots in the middle of the room, this is not quite satisfactory as the table cannot be moved with safety so as to take advantage of the daylight from the scuttles. I think it would be better if the table was not fixed but provided with removable rubber feet.

Surgeon G. D. G. Ferguson writes on a Visit to the Wreck of the "Emden."

In November we went down to the Cocos Keeling Islands in order to examine and search the wreck of the "Emden." It was anticipated that

[illegible]

some corpses would [illegible] with the "Sydney" had not been able to deal with them owing to military reasons and also because it was necessary to transport the large number of German wounded quickly to

hospital. On board we found thirty or forty corpses in advanced stages of decomposition and the duty of getting them [illegible] to enable the working parties to do their jobs in comfort fell upon me. Before leaving Singapore I had purchased rubber post-mortem gloves. With four volunteers (armed with chain hooks and shovels) who were not allowed to handle the corpses on any consideration whatever any such handling required being done by myself we disposed of them all into the sea without any mishap and buried them later when they floated

[illegible] Vessel [illegible] of burial [illegible]

ashore. As there was a large working party on board in the engine-room, was more or less permeated with oil [illegible] from the bodies I had [illegible] of disinfectant in various places about the ship and made [illegible] wash his hands at intervals on returning on board this step I made them wash both hands and feet in a solution of lysol and am glad to say I had no cases of blood poisoning or septic wounds. It was almost impossible to tell except in the case of recent gunshot wounds that had been

the cause of death in most of the bodies owing either to the blotted condition or advanced state of decomposition but so far as I could see most of the injuries were in the upper part of the body especially the head The "Emden" itself was very much knocked about and burnt out completely aft. It astonished me to see the amount of damage a 6 in shell could do The sick bay which is right in the bows of the ship was absolutely untouched It contained four cots, a small office and dispensary combined, was fitted out with an extraordinary variety of tabloid drugs and was very well found in instruments of every description

Fleet Surgeon EDWARD COOPER writes on the Action off the Falkland Islands —

At 4 15 the "Scharnhorst" was sunk and at 6 p m the "Gneisenau" also went down All three of our ships then steamed to the spot to pick up survivors The sea had been calm all day but by this time there was a very choppy sea which rendered the work of rescue difficult Our whaler was capsized but the crew managed to right it and our boats picked up forty survivors including two officers In the meantime, the sick bay and the flat outside had been got ready for their reception and we had a busy time resuscitating them, by means of hot blankets brandy, bovril and rubbing Seven died soon after being brought on board from exposure as the water was very cold about 42 but the remainder completely recovered after varying intervals I believe the total number saved was about 150

Fleet Surgeon E T BURTON writes on the Treatment of Venereal Diseases in the German Navy —

During the visit of a division of the Second Battle Squadron and three ships of the First Light Cruiser Squadron to Kiel in June 1914 I took the opportunity of calling on the Medical Officer in professional charge of the Lazarett (or Venereal Hospital) at Kiel Wick whom I had met some years previously at Portsmouth The information obtained from him may be divided into three headings (1) prevention (2) treatment during the acute stage (3) subsequent treatment

(1) PREVENTION

This is carried out in a similar manner to that in our own Navy Protargol however is used instead of argol and a solution of perchloride of mercury in place of calomel ointment These preparations are now supplied free of charge to the ship's companies but at one time the men were compelled to purchase them at a small cost from an automatic machine before going ashore The name of each man who goes to the sick bay for a preventive is noted and should a case of venereal disease develop this list of names is referred to as evidence whether he provided himself with the outfit Should he have neglected to do so he receives three days' punishment, which I learned might be increased to five days at the request of the medical officer

(2) TREATMENT DURING THE ACUTE STAGE

Unless the ship is away from a port no cases are treated on board, but are all sent to the lazarett

[illegible]—The treatment of this disease appears to be carried out [illegible] Several courses are given the number depending on [illegible] the disease and the manner in which the patient reacts [illegible] The first course consists of six injections of salvarsan [illegible] three to five days the initial dose is usually 0 3 gm and [illegible] 0 45 gm for subsequent doses The patient is [illegible] first few doses which are always given intravenously, [illegible] effects have been noted Salvarsan (old) is now used [illegible] results of neo salvarsan were found to be unsatisfactory [illegible] with the salvarsan the patient is given twelve intra- [illegible] of calomel in oil Mercurial cream is not used as [illegible] infiltration of the muscle and the formation of hard [illegible] Incontinently result and patients are liable to intoxication [illegible] absorption of accumulated injections of the metallic [illegible] not found with calomel The Wassermann reaction [illegible] blood and also with the cerebro spinal fluid, [illegible] puncture, and the latter is also examined micro- [illegible] cally At the end of the first course provided that [illegible] symptoms, the man is discharged to his ship and kept [illegible] on his stay in hospital having been about a month

(2) [illegible]—All cases are sent to hospital if the ship is in a home port Simple cases are treated with urethral injections of silver nitrate No irrigation treatment is carried out Should sequelæ such as epididymitis or synovitis occur, local treatment is suspended and the patients are treated with intravenous injections of collargol which I am told has excellent results, an inflamed testicle or joint becoming painless at the end of twenty four hours A microscopical examination is carried out in all cases

(3) Subsequent Treatment

After discharge from hospital syphilitics have an interval of about a month, and are then re admitted for a second course of six injections of salvarsan and twelve of calomel These courses are continued at intervals until not only the blood but also the cerebro spinal fluid give a permanent Wassermann reaction The medical officer states that in many cases after the blood has given a permanent negative Wassermann, he can obtain a strong positive reaction with the spinal fluid and that it is these cases which are so liable to syphilitic nervous conditions such as ataxic tabes dorsalis and paralytic dementia Consequently, these tests are carried out as nearly as possible once every year and further courses of salvarsan and calomel injections are given as necessary He states that cases of general paralysis of the insane if taken at an early stage are amenable to treatment, and he showed me one case originally affected with pupillary and bulbar as well as mental symptoms which had completely cleared up as the result of treatment He has records of several other similar cases In all of them the blood gave a negative and the cerebro spinal fluid a positive Wassermann In all cases of nervous syphilis the injection of salvarsan is given into the spinal membranes—in the same way as stovaine for spinal anæsthesia, but the dose is much smaller than when given intravenously and he had had no cases which had developed serious symptoms A complete detailed record of all cases treated at the hospital is kept

Reviews.

THE BIOLOGY OF TUMOURS By C Mansell Moullin, M.A., M D Oxon F R C S Lieutenant Colonel, R A M C (T), Consulting Surgeon to the London Hospital late Vice President Royal College of Surgeons Fellow of Pembroke College and Radcliffe Travelling Fellow, Oxford London H K Lewis and Co Ltd 1916 Pp 55 Price 2s 6d

In this work the biology of tumours is dealt with more thoroughly by the author than he was able to do in the Bradshaw Lecture delivered before the Royal College of Surgeons in 1912 and also his object is now to place the origin and classification of tumours upon a scientific basis

Tumours are divided into two classes according to their mode of origin, one class due to the sudden awakening of the innate reproductive power of the tissues in virtue of which they give birth to buds which grow into tumours and the other due to details of structure not being carried out as completely as they ought to be In other words his hypothesis is that all tumours except those due to defects in structural development originate in the latent power of direct or asexual reproduction a power which can be demonstrated in some animals and is possessed by some of the simplest forms of animal life The buds may arise from germ or somatic cells whose development has been arrested, all that is necessary being the presence of some stimulus, mechanical or chemical, to induce the latent reproductive power into activity He draws no distinguishing line between malignant and other growths malignancy being an occasional feature of all growths and of no fixed standard in his view it is a chemical feature only Tumours due to the revival of the primitive power of asexual reproduction include the vast majority both simple and malignant Their character whether malignant or not depends on the stage the parent cell has reached when its development is arrested, and upon this depends the forms that these tumours may assume a form that grows fast or a form that grows slowly, a form that remains circumscribed and limited, or a form that retains its embryonic characteristics spreads in all directions and invades other organs

The basis of the deduction is put before the reader in a clear and scientific manner and the book is extremely interesting Though the conclusions arrived at may differ in many particulars from those generally accepted who can say at the present time that they are not correct? If they are true it would seem that we must first know the intimate chemical changes which occur in the cell during its development, in fact almost the origin of life itself before we can treat the malignant new growth with any ultimate success.

THE SEXUAL DISABILITIES OF MAN By Arthur Cooper M R C S L R C P Consulting Surgeon to the Westminster General Dispensary formerly House Surgeon to the Male Lock Hospital London H K Lewis and Co, Ltd 1916 Pp viii + 227 Price 6s net

In this third edition of his work first published eight years ago the author has revised enlarged and otherwise improved the text The

[illegible] divided [illegible] of (1) Sterility (2) Impotence [illegible] Diseases and the whole of the original book [illegible] two parts the third part being entirely new

Part I deals with those [illegible] depend on some defect in the seminal fluid [illegible] which prevents its proper discharge

In the first chapter the [illegible] are considered, in the next two [illegible] ejaculation changes are respectively discussed [illegible] changes in the [illegible] death at the time of emission [illegible] congenital or acquired [illegible] Chapter IV [illegible] sterility occupies the last chapter of this first section of the book and resolves itself into removal of [illegible] in a given case

Having, by the aid of this book [illegible] of the different causes the reader [illegible] in those cases is obvious

Part II deals with defects in the apparatus concerned in the act of copulation the physiology of the sexual function being first considered and in successive chapters various departures from the normal are passed in review the last two chapters of this section being devoted to general and local treatment of such defects The author here impresses on the readers the importance of two big conclusions that the sexual inability is primary until the secondary or symptomatic forms of disability have been excluded

In Part III the subject of prevention of sexual disability is arranged in three chapters, the first of which includes the prevention of abnormal sexual indulgence and the second includes sexual excitement produced by salacious literature pictures or conversation while in the last two chapters the author briefly touches on the important questions of sexual perversion and venereal diseases in so far as they concern his theme

We know of no other text book in which these disabilities and their treatment are discussed [illegible] fully or with such discretion as in this volume

The importance of the subject to medical officers who have to teach men sexual hygiene cannot be over estimated

SURGICAL ANATOMY By John A C MacEwan, B Sc M B C M Fellow of the Royal Faculty of Physicians and Surgeons Glasgow Senior Assistant to the Regius Professor of Surgery Glasgow University Surgeon to the Elder Hospital Govan Assistant Surgeon to the Royal Infirmary Glasgow and to H S H Princess Louise Hospital Rosenstall late Civil Surgeon South African Field Force Captain R A M C (T) Hon Surgeon to the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers Second Edition London Baillière Tindall and Cox 1916 Pp xvi + 535 With 77 illustrations coloured and plain Price 10s 6d net

The second edition of this book is a considerable advance upon the first A special section on surface anatomy is now prefixed to each division forming a very useful addition the text has been thoroughly

revised [illegible] to date many sections have been entirely rewritten [illegible] considerable amount of new matter and numerous fresh illustrations have been added. Though this has contributed to increase in the number of pages the publishers are to be congratulated in preserving the former size of the book, a size very convenient for reading.

In the present edition there has been no material alteration in the [illegible] divided as before into five sections—head and neck, [illegible] brain and spinal cord, thorax, abdomen and pelvis, [illegible] and upper extremity. The author's object is to set [illegible] the anatomical facts of importance to the surgeon with [illegible] to their surgical bearing and to the physiology of the [illegible] support. To deal with so large a subject in a work of [illegible] is a difficult task, but on the whole the information [illegible] is fairly complete. On many points the teaching is dis[illegible] the Glasgow school and his method of surveying the anatomy [illegible] from the abdominal method of from the external surface [illegible]. The majority of the illustrations are from other [illegible] and are well chosen; but a considerable number are [illegible] good and instructive, particularly No. 29 [illegible] the [illegible] and all from behind, and No. 17, a diagram [illegible] the pelvic and perineal fascia.

[illegible] close reading as naturally the text is sometimes [illegible] is but owing to the space at the author's [illegible] in addition compares favorably with any work of [illegible] subject.

THE TREATMENT OF DISEASES OF THE SKIN. By W. Knowsley Sibley, M.A., [illegible] B.C. (Cantab.), M.R.C.P. (Lond.), M.R.C.S. (Eng.), Physician to St. [illegible] Hospital for Diseases of the Skin, President of the [illegible] Dermatological Society, Late Physician to the North-west London Hospital. London: Edward Arnold. 1916. Pp. 307. With [illegible] illustrations. Price 6/- net.

The first edition of this little book was published in 1913 and the second edition is preceded in order that the new scientific methods of treatment [illegible] of the last four years has been so fruitful may be placed before [illegible] general practitioners and students. A new [illegible] has been [illegible] numerous fresh paragraphs under [illegible] diseases have been [illegible] and short sections on treatment [illegible] of skin affections [illegible] to be found in the present edition. [illegible] special prescriptions in Part III have been revised, the [illegible] to the medical system have been arranged in a column [illegible] to [illegible] and a list of skin diseases for which they are [illegible] for each prescription.

[illegible] description of the uses to which X-rays, radium, [illegible] high frequency currents, carbon dioxide snow [illegible] are put with best advantage.

[illegible] skin disease is dealt with separately and in alphabetical [illegible] is indicated.

[illegible] vulgarity the author advocates the regulation of sexual [illegible] the laws of nature and says that unnatural abstentions [illegible] Sexual antiseptics seems to need amplification to avoid [illegible] misleading.

[illegible] and photographs of [illegible] illustrated [illegible] The volume would [illegible] a very [illegible] addition to [illegible]

THE [illegible] PUBLISHED IN FORRAINE ATTEMPTS OF THE ENGLISH NATION [illegible] Reproduced in facsimile with introduction and notes by [illegible] Miles Singer Oxford At the Clarendon Press 1915 Pp [illegible]

Captain [illegible] tells us that this quaint little work is the earliest devoted [illegible] military or naval medicine published in English and according to [illegible] probably the first of the kind in any language The pamphlet now [illegible] in facsimile has at the British Museum and is believed to be [illegible] copy Its origin is somewhat obscure but the editor advances sound evidence to prove that it was written by George Whetstone a typical Elizabethan gallant and man of many parts poet soldier and traveller Whetstone who travelled in the West Indies and suffered imprisonment in Spain uses old Spanish terms such as calenture (heat stroke) [illegible] (typhus or yellow fever) espinilas (prickly heat) and [illegible] (dysentery) Though not a physician some of the remedies he suggests are quite reasonable especially in regard to sanitation in the light of what was known at that period His reasons for publishing the pamphlet in his own words are In the expeditions of our time to the Southern parts from whence in this and forrain age the English have returned with renowned victory yet exceedingly oppressed with extreme and pernicious sickness that hath much more prevented the proceeding and performing of their pretensions than the power of enemies Captain Singer writes a most interesting introduction and appends scholarly notes on the text

EFFICIENCY IN FIRST AID (A MANUAL OF AIDS FOR SENIOR STUDENTS OF FIRST AID) By N Corbet Fletcher B A M B B C Cantab M R C S L R C P Lond Lecturer to the Colleges of Ambulance Regent Street Polytechnic L and N W and S E and C Railway Ambulance Centres Lecturer and Examiner to the St John Ambulance Association and the British Red Cross Society London John Bale Sons and Danielsson Ltd 1916 Pp vi + 200 Price 1s net

This book is supplementary to Aids to First Aid by the same author and is intended mainly for senior students of first aid in their work and examinations and also is an incentive to persevere in their studies and pursuit of efficiency A high standard of knowledge is accepted but the teaching throughout is very sound Provided the student has a good knowledge of the principles and practice of first aid a careful study of this little work is bound to increase his efficiency It is of a size convenient for the pocket

HOME NURSING IN FEW WORDS By J M Carvill M R C S L R C P L S A Lond London John Bale Sons and Danielsson Ltd 1916 Pp 14 Price 2d (paper) 4d (cloth)

This little book is in the form of a folder for the pocket and contains much essential information as the title implies in a few words It should prove a very useful reminder for Red Cross and nursing students and for all interested in the subject of home nursing

Abstracts.

[illegible] The Nature Manner of Co[illegible] Infantile Paralysis The sub[illegible] New York Academy of Medicine [illegible] Rockefeller Institute for Med[illegible] York [illegible]

This [illegible] to a minute filterable micro[illegible] been obtained [illegible] visible under the higher powers [illegible], and is [illegible] present in the central nervous system [illegible] of the [illegible] and intestine less frequently in the [illegible] and not in the blood of patients The difficulty [illegible] its [illegible] microscopical identification render[illegible] its detection little, but its presence can be h[illegible] which develop the disease In this [illegible] among healthy contacts has been proved a [illegible] though usually the virus does not persist in the [illegible] weeks The virus leaves patients and [illegible] in the [illegible] nose throat and intestines, and it is [illegible] transmit the disease The virus enters the body as [illegible] exclusively by way of the mucosa of the throat and nose, [illegible] transmitted by coughing, sneezing, kissing and by [illegible] nasal and intestinal discharges Experi[illegible] that paralytic diseases in domestic animals and pets differ [illegible] paralysis and that these animals do not convey the [illegible] infection is due to human contact The virus [illegible] to drying high summer temperature or even to weak [illegible] The incubation period varies from two days to two weeks [illegible] usually not more than eight days The severity of [illegible] varies and the mortality may be from [illegible] to 20 per [illegible] cent The virus is also subject to fluctuations in its [illegible] and relatively few adults are susceptible to [illegible] The degree of susceptibility is infinitely less than in [illegible] and diphtheria As there is no safe method of [illegible] the disease rarely spreads in hospitals [illegible] the means of prophylaxis Since serums are [illegible] therapeutic agents the best treatment is by [illegible] Fortunately the amount of human immune serum [illegible] are the only animals capable of providing this [illegible] serum is the only drug which both exerts a germ [illegible] injected into the cerebrospinal fluid but experi[illegible] seem to be effective in the early stages only of [illegible] to modify and improve this drug are as yet but [illegible]

H D R

[illegible] The Serum Treatment of Acute Poliomyelitis *Journ* [illegible] Chicago 1916 vol lxvii, pp 583 4

M[illegible] that recover from experimental acute poliomyelitis cannot be re infected [illegible] their blood and also that of human beings who have recovered from that disease contain antibodies which neutralize the virus

[illegible] such [illegible] by the [illegible] The immun[illegible] puncture into the [illegible] space These [illegible] in therapy in case [illegible] syst in an early [illegible] Concomitant [illegible] in the cases and [illegible] in the [illegible] recovered completely from the [illegible] previously [illegible] makes the [illegible] should be [illegible] from a healthy [illegible] not give a positive [illegible] reaction [illegible] who has [illegible] a very remote period so as to insure a high co[illegible] bodies as possible the serum which must of [illegible] be given as early as possible and [illegible] 5 to 20 c c according to the age of the patient [illegible] intrathecal injection of anti-meningococcus [illegible] performed and a suitable amount of cerebrospinal fluid being first removed H D R

WRIGHT (B L) The Treatment of Pyoinfection of Alveolus and its Secondary Systemic Infections by Deep Muscular Injections of Mercury *Medical Record* New York 1916 vol lxxxix pp 807 811

At the Navy Yard Portsmouth N H seventy five cases of pyorrhea alveolaris forty one with secondary systemic infections such as arthritis and lumbago were equally and completely cured by intramuscular injections of succinimide of mercury (1 g dissolved in hot sterile water) every seventh day The largest number of injections necessary was seven the fewest one and the average three Local treatment the expression of pus removal of stumps of tartar and the application of equal parts of tincture of iodine, tincture of myrrh and chloroform was also employed

The author a surgeon in the United States Navy believes that mercury is parasiticide for all vegetable parasites that during the first four days of an infection it directly destroys the parasite and that at later stages it sterilizes the production of antibodies In support of his thesis he quotes the rarely mercury of staphylococcic infectious puerperal septicemia and of cases of acute rheumatism resistant to salicylates Although he admits that the *Balantidium coli* is present in all cases of pyorrhea he denies that it be the cause for it never found in the blood or in the secondary infections but should it eventually be proved to be so, he considers that mercury must be regarded as a more powerful amoebicide than emetine H D R

IRVIN (S V) Umbilical Concretions *Johns Hopkins Hosp Bull*, Baltimore 1916 vol xxvii pp 187 8

Among 108 admissions to all services of the Johns Hopkins Hospital there were three cases such of umbilical abscess two of which were certainly and the other probably due to an umbilical concretion These concretions rare in childhood or advanced age are commonly seen in middle aged males of uncleanly habits with an unusually deep umbilicus and are generally composed of friable sebaceous material often containing cotton or wool fibres or even pieces of wood or stone Some concretions, however are firm hard smooth or pearly in appearance The first

symptoms is severe pain in the umbilical region followed about three days later by a red and indurated swelling, varying in size from that of a pea to a hen's egg fluctuation then appears, and after excruciating pain there is a gush of blood stained pus If the concretion is retained the discharge persists, and the diagnosis from a suppurating dermoid cyst arises H D R

WELSH (D A) AND BROWN (W S) The Intensive Specific Treatment of Epidemic Cerebro spinal Meningitis *Med Journ of Australia* 1916 vol ii, pp 113 117

Out of twenty eight cases treated from the onset by intensive measures two only proved fatal, and these from intra cranial pressure unrelieved by lumbar puncture Within the first twenty four hours in bad cases eighteen or twelve hours not less than 60 c c of serum must be given intrathecally On the third day lumbar puncture is always necessary but not serum unless the patient is very ill or the initial treatment has been delayed about 15 c c should suffice On the fourth day lumbar puncture and serum (10 c c) are advisable On the fifth day lumbar puncture but not serum is indicated and on the sixth lumbar puncture and serum (10 c c) may be required After this recovery should be uninterrupted, except that lumbar punctures may be necessary In septicæmia subcutaneous injection of serum should be given in addition The serums used were Parke Davis and Co s, Burroughs Wellcome and Co s and one made by Dr Bull of Melbourne and were found to be so germicidal that cultures from the cerebro spinal fluid were negative after one or two injections Relapses, not uncommon in ordinary treatment are due either to (1) recrudescence of infection, the result of insufficient initial treatment or (2) to reinfection from the oropharynx hence the importance of early disinfection of the throat A relapse should be treated in the same way as the primary attack Some form of anæsthesia should always be used for lumbar puncture With this form of treatment the success of antimeningococcic serum is comparable to that of anti diphtheritic serum therapy H D R

LUDLAM (C A) The Possible Role of Books in the Dissemination of the Contagious Diseases *Johns Hopkins Hosp Bull*, Baltimore, 1916 vol xxvii, pp 183 186

Although diphtheria bacilli may cling to inanimate objects for some time and although the spread of diphtheria has been popularly attributed to the handling of books previously used by diphtheritic patients this latter event has never been proved by the isolation of the diphtheria bacillus from such books The author examined 100 books, from fifty houses in which diphtheria existed by means of cultural tests and animal inoculations with a negative result Examination of seventy five books which had been in constant circulation among children in elementary homes showed that the majority of the bacteria found on the books belonged to the chromogenic group corresponding to the species usually present in atmospheric air, in no instance was the diphtheria bacillus isolated Pathogenic bacteria can seldom be isolated from books used by the sick but since virulent diphtheria and typhoid bacilli can be recovered from artificially infected books after long periods, books used by patients should be thoroughly disinfected H D R

[illegible] BRADLEY [illegible] W) The Transmission [illegible] d in Dengue [illegible] *Stegomyia fasciata* [illegible] *Culex fatigans* [illegible] 1914 200 203

In [illegible] 1916 dengue became prevalent [illegible] some of the towns on the north [illegible] of New [illegible] This opportunity to investigate the mode of transmission [illegible] was welcomed more especially because it was [illegible] the infective agent (a mosquito) was conveyed to a locality [illegible] the disease was not indigenous, experiments performed [illegible] free from the infection due to contemporaneous [illegible] uses of the disease This plan would therefore have [illegible] that employed in Syria by Graham, in Brisbane by [illegible] in the Philippine Islands by Ashburn and Craig, by whom *Culex fatigans* was regarded as the carrier of dengue—which the authors of this paper regard as improbable The following are their conclusions (1) *S fasciata* mosquitoes caught in a dengue infected district and some of them known to have bitten a dengue patient in the first and second days of his illness were transported to a non dengue locality (Sydney) and fed on volunteers four out of seven of these persons developed dengue Blood from three out of the four successful cases was injected into further volunteers who developed dengue the blood of the fourth case was not tested (3) The incubation period of the disease in the four cases was probably between six and a half and nine and a half days (4) No known cases of contagion occurred in connexion with any of the four cases (5) No evidence was obtained from two cases, one of which was repeatedly and heavily bitten by *C fatigans* that *C fatigans* can act as a transmitter of dengue In discussing the results of their experiments the authors point out that the mosquito after biting a dengue patient might not be able to infect another person until after some period had elapsed Hence collected mosquitoes might not prove successful transmitters because they were not ripe They did not try to solve the question of the incubating period if any or of the period during which the mosquitoes remain infective The paper is illustrated by charts showing the temperature and characteristic leucopenia of dengue and by a coloured print of the rash in one of the infected volunteers H D R

KILGORE (A R) Peripheral Neuritis following Emetine Treatment of Amœbic Dysentery *Boston Med and Surg Journ* 1916 vol clxxv, pp 380 382

In China the occurrence of peripheral neuritis after hypodermic injections of emetine is more frequent than is generally recognized very possibly because the tendency in that country is to give rather larger doses than that (1 gr daily for seven to ten days) originally suggested by L Rogers and others From a review of his own cases and those reported by others the author finds that peripheral neuritis often appears after the emetine injections have been stopped and that it may become progressively worse even though no more injections are given but that the ultimate prognosis is good and that no permanent disability is left behind The amount of emetine given to cases that developed neuritis has varied from 21 gr to an adult to 4 gr in a child, but cases which have received as much or more than those attacked by neuritis may be

unaffected A [illegible] out cases [illegible] four being under 9 years of age and the oldest [illegible] received the largest amount (6 gr.) of emetine H D R

FRASER (H) The Bacteriology of Dysentery [illegible] Malaya [illegible] 1916

In 1914 there were 5 982 cases of dysentery treated [illegible] hospitals of which 1 129 died and during the same period [illegible] were reported under head of dysentery and diarrhoea or 13 1 per cent of the total deaths This shows how important the subject is from a public health point of view

From the hospital at Kuala Lumpur amœbæ were found in 240 out of 819 cases of dysentery 63 of these were examined bacteriologically and dysentery bacilli were only found twice One hundred and [illegible] two cases of non amœbic dysentery were examined bacteriologically and dysentery bacilli were isolated from 72 Shiga type in 8 cases and [illegible] fermenting organisms in 14 cases The author considers that the latter can not be divided into [illegible] *types* as their [illegible] tions tend to vary from time to time and the agglutination reaction [illegible] unsatisfactory for differentiation He also states that the disease caused by the mannite fermenting dysentery bacilli does not differ from that associated with the *Bacillus dysenteriæ* (Shiga)

For the treatment of bacillary dysentery he recommends sanatoria [illegible] cines (the method of preparation is not stated) preferably autogenous P W B S

MCWEENEY (J G) A Note on Salonika Fever *Med Press and Circ*, August 9 1916 vol cii N S No 1031 pp 122 123

The author who has had considerable experience with the Forces in the Eastern Mediterranean draws attention to a very severe fever of short duration attended with marked prostration and [illegible] a high mortality The disease is described as a [illegible] and typhoid aggravated by broncho pneumonia [illegible] and malarial parasites are generally present It is stated that the lesions of enteric malaria and pneumonia found at *post mortem* [illegible] are more less marked than the clinical symptoms had indicated The Peyers patches may be inflamed or even ulcerated but the spleen is not markedly enlarged In some cases signs of chronic dysentery were present The fever lasts eg periodically and since if the more severe types have been mistaken for sunstroke

The author lays much stress upon the unfavourable predisposing causes which are present namely, a trying climate general mental and physical depression and the constant supply of food deficient in vitamines as he puts it Where patients have been living for ten or twelve months in a hot dusty insanitary environment on canned beef canned tinned soup canned jam dry biscuits canned milk canned meat and chlorinated water and you take them to hospital where they get canned milk frozen beef frozen chickens, frozen rabbits and tinned fruits it is difficult for the blood to become charged with that fresh abounding vitality which would enable it to shake off a fever

Quinine was found to be the most useful drug but did not appear to act as a specific

(The malarial fevers which abound around Salonika are chiefly due to the malignant type of parasite and pernicious symptoms are common—malaria, sunstroke, dysentery, &c. and from previous experience I know that these cases are often very resistant to quinine and difficult to cure. It is probable that the greater number of these cases are malaria occasionally complicated with typhoid.)

P. W. B. S.

WITTS (L. J.). The Value of Quinoidine in Malaria. *Indian Med. Gaz.*, September 1916, vol. xli, No. 9, pp. 335, with 3 charts.

Quinoidine, which is a colloidal substance resembling from cinchona bark after removal of the crystallizable bodies, has been distributed very largely to Government institutions and missionaries from the Alipur Juvenile Jail for some years. In 1913 the author recommended the use of this drug and no less than 3,500 lbs. have been sent out since. The reports received from various sources as to the value in malaria have generally been favourable, except that of Major MacGilchrist, who asserts that it is the least effectual of all cinchona products. His opinion was however formed on only eight or nine cases, which is small in comparison with the experience of the author. Owing to its slight solubility it is not so useful for very severe cases, but for ordinary tertian in large dispensary practice, its use would be attended with an enormous financial saving. The drug is made up in 2 gr. and 1½ gr. tablets. They are soluble in rectified spirit and glycerine, but precipitate on addition of water; each close should therefore be freshly prepared. In acute cases 12 to 16 gr. daily are sufficient, but a preliminary purge should be given.

(1) Quinoidine is slightly more toxic than quinine to guinea-pigs, but possibly less lethal to protozoa.

(2) It is cheaper, 4 rupees a pound against 24 to 50.

(3) It is when properly administered nearly as effective as quinine, and produces no cinchonism or gastric trouble.

(4) It is widely used in India.

P. W. B. S.

STINZIANI (R.). Experimental Researches on the Bacteriology of Leprosy. *Int. Proj. Vol. and Trans.*, September 1916, vol. x, No. 2, pp. 1607.

Professor Stinziani gives a short summary in English from his previous papers in Italian and German of the work he has been doing at Naples since 1911 on the etiology of leprosy.

Inoculation experiments were made with mice, guinea-pigs, rabbits and monkeys. He was able to infect rabbits by inoculating them with leprous tissue in the anterior chamber of the eye, and from these he was able to pass the disease on through two generations, but the percentage of successful subculture decreased at each passage. Various fast organisms like Hansen's bacillus and similar to that cultivated by Kedrowsky from human lepers was obtained from a rabbit on the 198th day after inoculation; this grew well but he was not able with it to infect animals. The author states that under definite experimental conditions leprosy can be communicated to rabbits, but that many failures and incomplete results must be expected; the investigator should be very patient and not draw conclusions too hastily, as has so often been done when studying this disease.

P. W. B. S.

News of the Service.

CASUALTIES

[illegible] —Surgeon Probationer A. L. Strachan, R. N. [illegible]

[illegible] The following Officers were killed in a [illegible], with [illegible]

[illegible] Ward

[illegible] C. H. Gaw

[illegible] G. A. Walker

[illegible] were wounded [illegible] on duty will be [illegible]

[illegible] Surgeon B. B. Erkins

[illegible] Surgeon J. N. McB. Ross

OFFICERS MENTIONED IN DESPATCHES

War Office, *October* [illegible] 1916

[illegible] Lieutenant-General Sir [illegible] Lake's despatch dated August [illegible]

[illegible] Officers through its special notice —

[illegible] Surgeon P. Camero[illegible] M.B. [illegible] Surgeon F. G. Hinch, M.B.

War Office, November [illegible] 1916

[illegible] France are added [illegible] of Officers mentioned for distinguished [illegible] General Sir Ian Hamilton's despatch, [illegible] 1916

[illegible] A. T. Bi[illegible] Staff Surgeon C. J. Coll[illegible] Stanford, M.B. Temporary [illegible]

PROMOTIONS

[illegible] promoted to the rank of Staff Surgeon [illegible] R. J. [illegible] John H. Burdell, Albert V. J. Richardson, M.B. [illegible] M.D.

[illegible] Officers are promoted to the *acting* rank of Staff [illegible] Hill, [illegible] Francis C. H. R. Black, M.D. William [illegible]

[illegible] A. V. O. promoted to rank of Deputy [illegible] November [illegible] 1916

[illegible] to Staff Surgeon, dated November 14, 1916

[illegible] rank of Staff Surgeon, dated November 14

[illegible] R. Stirling, M.B. [illegible] officially promoted to rank of Fleet [illegible] November [illegible] 1916

APPOINTMENTS

Surgeon

[illegible] Surgeon [illegible] Wood, added H. R. Jardine, M.B. to [illegible] H. [illegible] M.B. to the Victory, added T. Balsier, M.B. B.A. [illegible] W. [illegible] as Senior Medical Inspecting Officer to Surgeon [illegible] M. Hotel Tourquil, Dunkirk, to be Surgeon T. D. Hopkins [illegible] Chief of Stanley, C. de Matthew to the Arrogant, F. [illegible] H. [illegible] H. W. Hidden Greene to the Hyacinth, W. [illegible]

Staff Surgeon [illegible] M.B. [illegible] to be added H. H. L. Page to the Newcastle [illegible] Vice added W. W. D. Chill to the Blanche, R. [illegible] Knight to the Weymouth, J. [illegible] John [illegible] Vice added J. D. [illegible] to the Arrogance, M. T. Mak[illegible] M.B. [illegible] W. Hayden [illegible] Hillman, S.S. McKaplin to the Goliath, [illegible] the Pembroke, added T. W. Jeffery to the Perseus

[illegible] to the Vulcan W. S. Adams [illegible]
D. G. P. Bell D.S.O. to the Oil [illegible]
Hildebrand P. C. Arnold to the [illegible]
Whitehall Cooke to the Police C. S. [illegible]

Oc[illegible]

Deputy Surgeons General G. T. Brooke M.B. to Malta H[illegible] to Haslar Hospital J. H. Stephens M.D. [illegible] Hospital
Fleet Surgeons J. C. J. Reed [illegible] the [illegible] Broke [illegible]
Barnwell Hospital H. B. Murphy [illegible]
Artillery Infantry J. H. Ferguson to H[illegible] Lord Nelson [illegible]
the Hibernia J. K. Raymond M.B. to the [illegible]
F. Cooper to Greenwich College J. C. [illegible]
Dorrington P. Arkwright M.B. to the [illegible]
[illegible]
Staff Surgeons B. Connell M.D. R.A. to the [illegible]
the Vivid [illegible] V. B. Cox M.D. to the [illegible]
D. D. Turner to the Devonshire R. [illegible] M.B. [illegible]
[illegible] M.D. [illegible]
Surgeons A. C. Russell M.D. [illegible] to the Victory [illegible]
[illegible] W. J. Sligo to the Marlborough [illegible] to Haslar Hospital [illegible]
to the Pembroke [illegible] W. F. Eddy [illegible] the Victory [illegible]
Staff Surgeons D. N. V. R. [illegible] Stockman M.B. to the [illegible]
Stockmann M.B. to the Skirmisher W. [illegible] Hart M.D. to be Assistant
Inspector of Office in Tonnage [illegible]
Surgeon R. N. A. D. [illegible] W. Smith to the [illegible] Broke [illegible]
the Pembroke [illegible] W. H. [illegible] M.D. to the Victory [illegible]
[illegible] M.B. to the Black Prince M.B. to the Speedwell W. [illegible]
[illegible] M.R. to the Desire [illegible] W. [illegible] to the Theseus [illegible]
[illegible]
[illegible] Surgeons W. Elliot [illegible] Home Hospital T. J. W. [illegible]
[illegible] Cooke [illegible] the [illegible] Broke [illegible] T. W. [illegible]
[illegible] Craig [illegible] the Orontes [illegible] to Fever M.D. [illegible]
[illegible] Wright M.D. to the Victory [illegible] Nelson M.D. [illegible]
[illegible] H. S. Jerrard [illegible] the Rattlesnake V. C. Rutleigh M.D. [illegible]
[illegible] H. [illegible] the [illegible] Broke [illegible] W. [illegible]
[illegible] Cole [illegible] H. Stone [illegible] Hospital T. G. [illegible]
[illegible] Cornwallis M.D. M.R.C.S. to the Victory [illegible] H. [illegible]
[illegible] W. Drake M.D. to the Cumberland H. Lane M.B. to the [illegible]
[illegible] M.A. [illegible] M.D. [illegible] Dido M.D. to the [illegible]
[illegible] the Inflexible D. Sellers [illegible] Impleffield [illegible]
[illegible] Cowell M.D. [illegible] Lowe [illegible]
[illegible] Sell [illegible] Melita H. [illegible] to the [illegible]
[illegible] Bell [illegible] S. Leddy [illegible] the Hecate [illegible]
[illegible] W. [illegible] M.D. [illegible] Victory [illegible] P. D. W. [illegible] the M.D.
[illegible] Victory [illegible] M.D. [illegible] Victory [illegible] H. [illegible]
[illegible] M.D. [illegible] Cole [illegible] J. Spratt M.D. to the Victory [illegible]
[illegible] Cole [illegible] J. B. [illegible] to the [illegible]
[illegible] M.D. [illegible] R. A. [illegible] M.D. to the [illegible] Hospital
[illegible] W. [illegible] the Stromboli [illegible] to
[illegible] Stokes M.D. the Queen [illegible] J. J.
[illegible] R. S. [illegible] Fever [illegible] W. [illegible] the Dragon [illegible]
[illegible] M.D. [illegible] the Achilles [illegible] M. [illegible] to Haslar Hospital J.
[illegible] H. [illegible] Hospital [illegible] the M.D. to Plymouth H. [illegible]
[illegible] M.D. S. M.D. [illegible] H. [illegible] the [illegible] Trumwell to Haslar Hospital
[illegible] to Haslar Hospital [illegible] M. [illegible] H. [illegible] to the Prince [illegible] J. S. M.D.
[illegible] Hospital J. C. [illegible] M.D. [illegible] M.D. [illegible] the Vengeance T. M. Rimmer [illegible]
[illegible] J. Richards M.D. [illegible] the Blue G. S. Mest [illegible]
[illegible] Fatton Haslar Hospital R. Lowe [illegible] to the Victory
[illegible] M.D. to Hilton H. Hospital [illegible] Dunn M.D. [illegible] H. Sh[illegible]
[illegible] W. Hoyt to the Hawke [illegible] the Victory to Hotel the Hospital
[illegible] M.A. to H. M.D. [illegible] M.D. to Haslar Hospital
[illegible] to Hospital A. H. Hare [illegible] M.D. to Haslar Hospital
[illegible] the Hecate [illegible] M.B. to the Wellington H. [illegible]
[illegible] the Lambton [illegible] to Mull [illegible] the [illegible] Brook

to the Q[illegible] to Haslar Hospital B[illegible] Hospital D J Max M[illegible] added

Surgeon [illegible] R N V R D S Macgregor to H[illegible] W Irall to the Marguerita [illegible] to the Wallflower R [illegible] Sanderson [illegible] to the S H Waddy to the [illegible] J A Gale to the Mallard E J G [illegible] to the Camellia J Allan to the Strath W [illegible] Robertson to the [illegible] J Nelson to the Nor[illegible] Na Mercy to the Dragonne [illegible] to the Ord to the Forests [illegible] Morgan to the Mallrook [illegible] Woodhouse to the [illegible] A P Birdwhistle to [illegible] J J M[illegible] to the Minnet [illegible] the Heather [illegible] to the Rosetta J Stone [illegible] the Indefatigable [illegible] Nepean [illegible] G P Walker [illegible] Thomson [illegible] Fletcher [illegible] W L Dallas [illegible] Armstrong [illegible] Hospital N W Dawson to the Rail [illegible] to the Hecla [illegible] Nelson [illegible] to the Pitmaston [illegible] to the Rival [illegible] Mitchell [illegible] J Jones [illegible] to the Hecla [illegible] Hospital Pay to the [illegible] R N [illegible] Mansfield A Nicholson [illegible] to the Orion [illegible] to the Dryad [illegible] Hospital

Staff Surgeon [illegible] M B A [illegible] Cherry [illegible] to the [illegible] Vestal [illegible] the Vestal [illegible] added

Staff Surgeon [illegible] M B [illegible] the Wildfire [illegible] Hospital [illegible] Staff Surgeon [illegible] Hospital [illegible] Staff Surgeon [illegible] Surgeon [illegible] Hospital [illegible] Hospital [illegible] the Wildfire [illegible] Hospital [illegible] Hospital [illegible] W B Sam [illegible] R N Sick Quarters [illegible] T C Summers [illegible]

[illegible]

ADMIRALTY ORDERS ISSUED FROM SEPTEMBER 1, 1916, TO DECEMBER 8, 1916

(Only the more important Orders pertaining directly to the duties of Medical Officers affloat and not contained in other sections included)

2843.—Medical Stores.

Submarines

(M.D. 1078/16.—21.9.1916.)

[illegible] medicinal medicines has been added to the authorised scale of stores to be allowed to Submarines.

Medical Officers in charge of ships should indent on the Naval Medical Depots [illegible] quantity to complete their requirements.

2865.—Short Certificates.

(M.D. 1167/16.—11.10.1916.)

[illegible] Medical Officers [illegible] Short Certificates [illegible] Trawlers &c.

[illegible] Medical Officers in charge to ascertain whether the ship [illegible] Short Certificate [illegible] Medical Officers in charge of the ship to which the [illegible] Medical Officer in Charge to transmit [illegible] hospital.

2912.—Candidates for Coding or other Non-Combatant Work.—Medical Examination.

(C.W. 1183/16.—1.9.1916.)

When examining candidates for posts as Leading officers or for other specialized employments Medical Officers are to make certain

(1) That the candidates are totally unfit for general service

(2) That notwithstanding certain physical disabilities they are personally fit for the special duties they wish to enter for. Add

(3) [illegible]

2514.—Accumulator Pocket Lanterns for Medical Officers.

Admiralty Dockyards Circular.

(N.S. 10840/15.—6.10.1916.)

The approval to supply Accumulator Pocket Lanterns, pattern 3381, for the use of the medical officers in H.M. ships is intended to apply also to Medical [illegible]

One lantern will be supplied to each medical officer borne and [illegible] is also intended to be provided in the usual manner in any Motors not already supplied.

2518.—Methylated Spirits for Sterilizers.

Destroyers.

(N.S. 11644/16.—6.10.1916.)

The following addition to the establishment of Depot ships for Destroyers has been approved, viz.—

[illegible] 107 Spirits, Wine, methylated, 1 pint. Medical Officer's [illegible] attached Destroyers, which a Medical Officer is borne.

[illegible] Requisitions from Depot ships should be referred direct to the Dockyard [illegible]

2780.—South African R.N.V.R.—Medical History Sheets.

(N.M. 1823/16.—10.10.1916.)

The majority of the ratings of the Special Service Division, Royal Naval Volunteer Reserve, have not yet been supplied with Medical History Sheets.

Ship [illegible] which such ratings are now [illegible] are orderly [illegible] Medical History Sheet provided [illegible] Special certificate [illegible]

The Medical Officer of the Division [illegible] Medical [illegible] and [illegible] discharge.

2781.—Hospital Treatment—River Tyne.

(M.O. 1424/16.—11.11.1916.)

It has been [illegible] that the Naval Hospital [illegible] Hospital [illegible] Medical Officer of H.M.S. "Satellite" [illegible] water.

(C.M.O. 1.11.1916.)

2865.—Bacteriological Examinations.

Ships in Scottish Waters.

(M.O. 1624/17.—3.11.1916.)

The R.N. Hospital, Royal Hospital, Edinburgh, [illegible] all the bacteriological work [illegible] H.M. Ships in Scottish Waters.

2833.—Drinking Water: Measures to Ensure Purity.

(M.H. [illegible] 1916.)

Chlorine should not be supplied in water [illegible]

(2) The directions in M.O. 1.8.1916 should be carried out [illegible] ordinary Calcium Chloride [illegible] substituted for Chlorine.

(3) [illegible] proportion of [illegible] to 100 gallons [illegible] ensure that the residual Chloride of Lime will [illegible] fourth ship [illegible] proportion [illegible] Naval Stores. [illegible] to all Sterling Dockyards. The [illegible] Chloride [illegible] has been [illegible] used by [illegible] for all ships.

(M.O. 478/1916.)

(M.H. 1619/1916 [illegible])

2965.—History Sheets of R.N.V.R. Ratings—Disposal

(N. 58668.—10.11.1916.)

[illegible] History Sheet (Gunnery, Torpedo, Signal and Wireless Telegraphy) of Royal Naval Volunteer Reserve ratings discharged from the Service are to be sent to the Admiralty, Atlantic Committee, 37 Avenue Street, S.W., for custody and disposal. [illegible] History Sheets of such men must be sent to the Director General Medical Department, Admiralty, as heretofore.

(Art. 543 (d) and 831 (3 and 4) in R. and A.L.)

3031.—Medical Transport Office, Hull

(M.D. 1384/16.—10.11.1916.)

[illegible] Medical Transport Office, Hull, [illegible]

(Telephone address—Medtrans, Hull.
Telephone number—Central 602.)

[3251.—Scabies—Treatment

(M.D. 1895/16.—1.12.1916.)

[illegible] to all medical officers [illegible] drawn to the necessity of a definite [illegible] which all the present than are generally longer and [illegible] on a standard outline [illegible] the principal stages of Treatment [illegible] Surgeon Probationers [illegible] —

[illegible] be given a [illegible] bath (1 to 200) [illegible] the strength of [illegible] Medical Officer of [illegible] the required [illegible] advice [illegible]

[illegible] to be repeated [illegible]

(3) [illegible] the [illegible] bathing worn [illegible] dress. The [illegible] Legal [illegible] shirts, shirting, cashmere [illegible] two [illegible] [illegible]

(4) [illegible] clothing [illegible] to take another bath [illegible] clothing. [illegible] bathing. [illegible] washing [illegible] clothing, [illegible] treatment [illegible] time [illegible] as before [illegible] be sent to duty on the following morning.

3252.—Galyl Injections in Hospital Ships

(M.D. 1314/16.—1.12.1916.)

[illegible] all galyl [illegible] ships sent to Hospital Ships [illegible] galyl [illegible] of such [illegible] of occasional [illegible] different [illegible] recent. The correct dose [illegible] intervals [illegible] However, [illegible] in all instances, unless from medical reasons, it is not advisable [illegible] decided upon [illegible] medical grounds the alteration [illegible] shed done [illegible] intervals should be [illegible] Senior Medical Officer of the ship to which the [illegible] should be made in each [illegible] treated [illegible] Hospital.

Bacteriologists Alerted

[illegible] should be all [illegible] day [illegible] galyl [illegible] should be [illegible] galyl [illegible] case [illegible] further [illegible] should be [illegible] [illegible] Hospital Ships [illegible] home [illegible] [illegible] the patient [illegible] [illegible] administration [illegible] of [illegible]

***3346.—Surgeon Probationers R.N.V.R. Passage, &c. Expenses on Demobilization**

(M.C. 2431.—8.12.1916.)

[illegible] who are [illegible] demobilized [illegible] that they may [illegible] the repayment of any passage [illegible] expenses incurred in connection therewith.

3307.—Wassermann Test—Information to Accompany Blood sent for [illegible]

(M.D. [illegible] 1916.)

When blood is sent to Hospital [illegible] as to the Wassermann [illegible] Medical Officers are to forward also the following particulars:—

1. Name of patient with [illegible] to which he belongs.
2. Whether blood is sent for diagnosis [illegible]
3. Probable date of infection [illegible]
4. Present symptoms or lesions [illegible]
5. Original symptoms or lesions [illegible]
6. Nature and amount of treatment [illegible] the patient. Whether [illegible] under a course of treatment now, [illegible] the date when [illegible] last received.
7. [illegible] results of former blood tests and [illegible] performed.

(M.D. [illegible] is cancelled.)

OBITUARY

Killed in Action

Surgeon John Scott Ward was killed in the Battle of the [illegible] while serving with the Naval Division. Born in July 1881, [illegible] the Rev. J. W. Ward, Chaplain R.N., he was educated at [illegible] and the Royal College of Surgeons, Edinburgh, gaining, during [illegible] professional subjects. He qualified L.R.C.P. [illegible] in 1907. He entered the Royal Navy in May [illegible] the Surgical Medal [illegible] radiography [illegible] the Medicine and [illegible] during the [illegible] September 1914 [illegible] Hospital at [illegible] Naval [illegible] professional skill [illegible]

Temporary Surgeon [illegible] Humphreys [illegible] was killed in the Battle [illegible] November 1914 while serving with the Naval [illegible] Hospital of Westminster [illegible] and the St. Bartholomew's Hospital [illegible] in 1915 [illegible] M.R.C.S. [illegible] L.R.C.P. [illegible] Hospital [illegible] September 1914 [illegible] Naval [illegible] [illegible]

Temporary Surgeon [illegible] Maybury was killed in the Battle of the [illegible] November 1914 while serving with the Naval Division [illegible]

[illegible] gained a [illegible] of House [illegible] Resident [illegible] 1911 [illegible] upon [illegible] football [illegible] key [illegible]

[illegible] STRACHAN [illegible] Born 1894 [illegible] and Aberdeen [illegible] Anthropological [illegible]

Died

[illegible] of septicaemia [illegible] at the [illegible] Montgomery County [illegible] College [illegible] open exhibition [illegible] Middlesex [illegible] Rugby football [illegible]

[illegible] GREENE [illegible] Donegal [illegible] 1901 [illegible] Honours [illegible] Rugby [illegible] colours [illegible] Flag Ship [illegible] Captain [illegible] the Station [illegible] 1901 [illegible] Baltimore [illegible] 1912 and [illegible] attended [illegible] Dockyard [illegible] the loss of [illegible]

VOLUME III APRIL, 1917 No 2

Journal of the Royal Naval Medical Service.

Original Articles.

DRESSING STATIONS IN LARGE SHIPS AND THE SURGICAL WORK POSSIBLE DURING AND AFTER AN ACTION

By FLEET SURGEON CHRISTOPHER L W BUNTON M I R N

THE compartments allotted for the reception and treatment of wounded in action have been variously designated dressing stations, reception stations, first-aid stations collecting stations, distributing stations, &c and a good name has yet to be found Of those in use the first mentioned seems perhaps the best, and the last (the official name) is certainly the worst and indeed quite a misnomer as far from anything being distributed from these places, everything in the way of medical stores and surgical appliances is collected there before an action

The requirements of a good dressing station are that it should be fully protected easily accessible thoroughly ventilated, well lighted, and have a good supply of both hot and cold water with fixed basins and efficient waste water service

From my observations of some modern ships it would seem that a combination of protection and accessibility means a gradual approximation of the dressing stations to the large uptakes from the stokeholds and boiler rooms This immediately introduces the difficult factor of a high temperature a disturbing element where badly wounded men have to be considered How far this increased temperature can be obviated by asbestos lagging on bulkheads and

improvement in ventilating arrangements is a matter for trial and investigation It seems to me that the whole subject is one of shipbuilding and that the site of dressing stations might be more seriously considered whilst a ship is yet in the earlier stages of construction The evolution of the dressing station has been very gradual and its necessity slow of recognition At first some comparatively protected part of the ship which would not be much used in action, was chosen by the medical officer, who caused some dressings to be placed there during 'general quarters Afterwards cupboards were constructed in these places so that some appliances and dressings could be permanently stored there and later still, as the necessity for a hot-water supply became evident, Watsonian heaters were added

In modern ships of any size at least two compartments one forward and one aft, are specially allotted and equipped for the reception of the wounded—the official "medical distributing stations '

Although however, the provision now made is vastly superior to the elder arrangements it still cannot be said to be perfect and many additions could be made with advantage

The necessity for fixed washing basins and sinks with proper waste-pipes is very evident At present in some modern ships only portable basins are in use and as during the treatment of wounded a large quantity of waste water arises, this must either accumulate in the dressing station, a most undesirable arrangement or be carried up from time to time, causing unnecessary opening of the station and exposure of the bearers That old bugbear the integrity of water-tight bulkheads is always brought forward to account for such a glaring omission from a dressing station as a proper waste-water service If its necessity was duly appreciated it could certainly be provided for during the construction of the ship

The ventilation of a dressing station during action is of necessity entirely artificial and as high a standard as possible is required in view of the concentration of the wounded there, and the limitation of the air space per head Both supply and exhaust fans are necessary and if the station is a large one it is very desirable to have more than one of the former The inlets to each supply fan should be placed as widely apart as possible, preferably on a different deck or level—the importance of which will be seen later The fans for dressing stations should not be shared with other important compartments so preventing inconvenience should an emergency render it necessary to stop them temporarily The possibility of

[illegible] fumes and gases finding an entrance into the dressing stations by way of the ventilating system has [illegible] attention. It is evident how easily this might [illegible] hurst in the vicinity of the inlet to a supply fan or should a supply trunk become damaged by an explosion between decks. In these eventualities the action of the supply fan would soon render the dressing station uninhabitable, and if the fumes were very noxious and sufficiently concentrated they might possibly prove fatal to some of the patients before the compartment could be evacuated. Owing to the high speed at which a ship would be moving during action gases from shells would have little chance of hanging around for very long, but would become rapidly dissipated by perflation. If therefore suction of air through ventilating inlets could be temporarily suspended little more would be necessary and a free ventilation of the dressing station could soon be re-established.

It is thus seen how necessary it is that the fans should be immediately controllable by switches placed in the dressing station itself so that at the first suspicion of any entry of fumes all supply fans could be stopped and the valves at the entry of the trunks into the station closed. Meanwhile the exhaust fan could be allowed to run, and as soon as time had been given for the fumes to dissipate, the purity of the supply might be again cautiously tested. Of course as long as all goes well during an action both exhaust and supply fans should be kept running at full bore. Even a temporary dislocation of the ventilation would be provided against if there were more than one supply fan if the intakes to them were widely separated and if the controlling switches were situated in the dressing station.

As a rule the lighting of dressing stations leaves nothing to be desired and a good light over the operating table is secured by wandering leads. A secondary lighting system should always be provided for temporary use in the event of shell fire causing damage to the electric leads. Candles are much more satisfactory for this secondary system than oil lamps, since the enormous concussion caused when a ship is struck by a shell is liable to dislodge the oil which may take fire and cause serious inconvenience.

For the same reason sterilizers heated by spirit are unsuitable for use during action, and the supply of an electric sterilizer to larger ships might with advantage be duplicated so that one would be available for each dressing station.

The question of how much surgical interference is advisable or justifiable on board, under the conditions which must prevail during

[illegible] after an action [illegible] of discussion [illegible] certain [illegible] to operation [illegible] and Lastly the [illegible] which [illegible] (with due consideration for the welfare of the [illegible] In the second place, under the circumstances, it is practically impossible to ensure even moderately aseptic conditions The station is crowded with wounded, and constantly being invaded by fresh patients requiring immediate attention many of whom being covered with dirt and grease from the decks and soaked with salt water from the hoses, need rough washing and cleaning before even the nature of their wounds can be ascertained

As regards the time that wounded are likely to be retained on board after an action I think our recent experience in the Battle of Jutland may serve as a rough guide On that occasion the majority of our wounded were placed on board a hospital ship less than forty eight hours after the infliction of their injuries I should be inclined to consider this period as representing the maximum delay of wounded on board since owing to more or less exceptional circumstances the Fleet remained for a considerable time in the vicinity of the original action with a hope of cutting off the enemy from his base and resuming the engagement Under ordinary circumstances a period of twenty four or thirty-six hours would probably be the more usual time to count on as available for examining and dressing the wounded and when the many little details of organization, so necessary when a number of cases have to be got ready for disembarkation, are remembered this time would seem quite inadequate to allow of any prolonged operations upon individual cases

As regards the amount of operative interference advisable in dressing stations much must naturally be left to the opinion of the medical officer who alone can form a correct judgment from the exigencies of each case

However my experience in a double rôle that of an operating surgeon in a hospital receiving wounded from ships after an action and that of a surgeon in charge of a ship sustaining many casualties in the Battle of Jutland, leads me to deprecate strongly the performance in dressing stations of operations which could be deferred with safety till patient had been transferred to the more favourable conditions obtaining in a hospital ship or shore hospital

The surgery best adapted for dressing stations during, or immediately after an action would seem to be an amplified first aid treatment.

[illegible] the [illegible] rendering [illegible] the well [illegible] special care [illegible] the [illegible] of wounds. [illegible] thoroughly cleansed [illegible] soaked in [illegible] strong antiseptic [illegible] mended ([illegible] carbolic acid [illegible] chlorite of soda &c.) Rubber [illegible] will be worn for all manipulations within wounds. After [illegible] work in a dressing station—much of it manual assistance [illegible] patients—it will be found that a surgeon's hands have become [illegible] and dirty that it is only courting disaster [illegible] wound after the usual scrubbing and disinfection.

It would seem [illegible] precaution to give a hypodermic injection of antiseptic [illegible] and a note of this having been done should be made on [illegible] for the information of the receiving surgeon.

Provided they are [illegible] outward or dangerous symptoms from their presence [illegible] embedded are better left in situ. Owing to their [illegible] temperature at the time of entry they are probably [illegible] and the manipulation required for their removal only increases the risk of infection and may start afresh some haemorrhage which it may be difficult to control. As a rule there is little haemorrhage from shell wounds owing to their lacerated nature and the searing of the tissues from the high temperature of the shell fragments.

The question of amputation of limbs is certainly best postponed till the patient is transferred to a hospital or hospital ship. Of course where a limb is practically severed and all hope of its preservation out of the question it may be quickly snipped off with a view to facilitating patient's locomotion. But one sees so many cases in which limbs at first sight irreparably damaged have been ultimately saved by careful and prolonged hospital treatment, that one would hesitate before deciding on their removal more especially as in the majority of cases under the conditions I have indicated, nothing is to be gained and everything is risked by too precipitate surgery.

Doubtless many circumstances may be conceived which would make an immediate operation imperative, and if one has to be undertaken it is as well to make it as thorough and final as possible.

[illegible] however I should [illegible] to postpone major surgery [illegible] unnecessary [illegible] truly [illegible] welfare of his patient than if he had become [illegible] into the performance of operations in the conditions surrounding an action be his skill ever so great As shock is the most common condition seen in the dressing stations, and as nearly all patients brought there are suffering from it to a greater or less degree according to the extent and nature of their injuries I will make a few remarks about its treatment

Two forms of shock or collapse may be referred to which are clinically indistinguishable, and equally dangerous to life from a fall in blood-pressure One condition may arise from loss of fluid from the vessels after an extensive haemorrhage the other from any grave injury or an extensive burn causing paresis of the vasomotor centre and stagnation of the blood in the splanchnic area

The treatment of these two conditions is somewhat different Whereas in the first the prompt infusion of saline solution, intravenously subcutaneously, or per rectum according to the powers of absorption present is urgently indicated in the latter it is a less hopeful proceeding unless something such as adrenalin which has the power of raising blood-pressure by its action on the peripheral arteries is added

Adrenalin may also be used by itself subcutaneously, but as its effect on blood pressure soon passes off, a fresh injection will be necessary from time to time Pituitary extract if obtainable, is infinitely preferable to adrenalin as its action on intra arterial pressure is much more prolonged and often lasts, it is said for twelve or fourteen hours In the free and early use of morphia, we have a valuable means of minimizing the intensity of shock, controlling restlessness and adding to the general comfort of our patient The employment as an initial injection of less than one third of a grain seems of little use, and this amount can be increased with advantage in the majority of cases The beneficial action of morphia results from its obliterating effect on afferent sensory impulses which, if allowed to continue, may increase the degree of shock present by causing reflexly a further lowering of blood-pressure

Strychnine, alcohol and ether will all be found useful in tiding over shock since they cause a rise in blood pressure by directly stimulating the vasomotor centre Unfortunately their action is only of short duration, and it is necessary to continue their use

from time to time, the disadvantage being that each stimulation leaves the centre more exhausted than it was before, and the blood pressure lower

Such mechanical means as strapping pads over the abdomen, bandaging the limbs over cotton wool from below upwards and placing the patient on an inclined plane with his head the lowest point may be mentioned as suitable for certain critical cases, with a view to holding up blood-pressure and keeping the supply of blood in the cardiac and respiratory centres

Great thirst and persistent vomiting proved troublesome symptoms in many cases of shock following extensive burns Small quantities of hot water by the mouth may prove beneficial, but if these cannot be retained rectal saline injections should be tried

It is very important to provide for the maintenance of the body heat, a patient in a state of shock should be kept in blankets surrounded by hot-water bags A supply of these articles is a very necessary equipment of every dressing station and will prove invaluable after an action The substitution of hot water bottles has been suggested, but their use is not practicable, since a patient s body cannot be surrounded by them in the same way as can be done with bags Moreover the employment of anything breakable is especially unsuitable for use in the tier system of stretchers recently introduced, where a restless patient may easily dislodge it on to the deck below or even on to a patient beneath with undesirable consequences

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[illegible] OF WAR [illegible]

[illegible]

THIS article refers to [illegible] the Royal Naval Hospital [illegible] the War. The cases were [illegible] the Battle of Jutland [illegible] received from the [illegible] following fact—that [illegible] patients had arrived in [illegible] cases before shock had [illegible] burns were shortly [illegible] that the cases had with [illegible] primarily to [illegible] picric acid dressings. [illegible] practical and efficient [illegible] only be used as a first aid [illegible] dressing, such as [illegible] Surgeon Major [illegible] H.M.S. Tiger is excellent [illegible] tiger wounds [illegible] that its removal [illegible] the patient [illegible] dressing although applied [illegible] comes dry [illegible] ship after an action when the [illegible] treated in [illegible] where the air is dry and hot [illegible] removal of such dressings [illegible] pain is relieved and a deeper [illegible] is caused, some of the [illegible] tissue is coming away on the dressing. Secondly it would be [illegible] more in favour of dressings [illegible] with [illegible] painting might be carried through but the whole [illegible] covered with dry dressings. Finally such a dressing is septic and soothing and acts as a deodorant.

Of course, one finds that the actual method of treatment is determined by the degree and extent of the burn, the constitutional factor and the condition of the actual wound. The dressing which favours sloughing of the dead tissue, promotes fertility and promotes granulation and the growth of new skin. Shock, the effect of absorption of toxins and the condition of the urinary apparatus are important factors.

But it is the after treatment of burns that has fallen to the lot of medical officers in naval hospitals and this is the routine treatment at Queensferry. Morphine to control pain and favour rest, a stimulant such as strychnine where shock is present, intravenous

Fig. 1. Case N
Condition [illegible]
[illegible]

Fig. [illegible] Case No. 2
Condition [illegible]
[illegible]

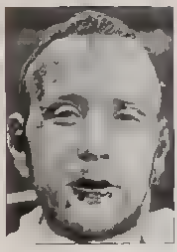

Fig. [illegible]
[illegible]

Fig. [illegible]
[illegible]

Fig. [illegible]
[illegible]

Fig. [illegible]
[illegible]

Fig. [illegible]
[illegible]

Fig. [illegible]
[illegible]

Fig. [illegible] No. 4
Condition after [illegible]
treatment [illegible]
[illegible]
[illegible]
[illegible]

[illegible] C. W. [illegible] RN

[illegible] degree burns [illegible] been removed and the burn is aseptic and not painful [illegible] is applied. Should the burn be very painful, 1 2 per [illegible] solution of aluminium acetate on lint is the best application [illegible] superficial burns. In second and third degree burns [illegible] only applicant is used. This was used with su[illegible] Danger Bank and Jutland Coast actions with excellent [illegible]. It consists of —

Menthol 5 grams, eucalyptol [illegible] and Cinnamon oil to the ounce.

This emulsion is applied to the burnt [illegible] consists of [illegible] wool; no dressing whatever is applied. The patient is placed out doors in the sunshine. The keynote [illegible] hands off. In the [illegible] method accompanied by local application the removal of tissue [illegible] besides causing great pain destroys the protective covering [illegible] granulations. The contrast between cases treated without [illegible] and those treated with dressings is very striking. The terror [illegible] waiting for the next dressing the groans which accompany [illegible] a dressing and the comparative air of comfort and well-being [illegible] the other are not quickly forgotten. It is impossible to agree with Staff-Surgeon Wilson [4] who states that immediately a burn is known to be septic hot boracic fomentations should be begun. I have found by experimenting with septic burns treated by fomentations that if on removal of the dressings the surface of the lint is gently scraped and the scrapings removed to a microscope slide cells from the deeper layers of the skin can be recognized. This means that the burn is becoming deeper instead of healing, in fact it is easy for a second degree burn to become one of the third degree. An advantage which fomentations are said to possess is that they are very soothing. In my experience this is not so: the application and removal are both painful.

It is found that burns of the second and third degree if treated in the open air with an emulsion such as is used at Queensferry, quickly crust over (see figs. 1 and 2), and according to the depth discharge purulent fluid under the crust which is raised and takes on the appearance of rupia. When the exudate beneath the crust is not great the crust is allowed to remain until it falls off, leaving a reddened healthy surface without scar. Where the deeper burn produces a large exudation the scab is lifted until it is loosened in nearly all its parts, and a granulating surface bathed in purulent

fluid is [illegible] These crusts should be left as long as possible but if [illegible] necessary to remove them and clean the [illegible] dating surface thus exposed by gently mopping with cotton wool moistened with normal saline solution

There was not a single case of nephritis in the burn cases received after the action on May 31 1916, and I am of the firm opinion that cases of nephritis are much less frequent when treated without dressings than with them

FORTY CONSECUTIVE CASES RECEIVED AFTER THE BATTLE OF JUTLAND

No	Age	Situation of burns	Degree of burns	Result
1	19	Face, [illegible] and trunk	2nd and 3rd	After first week patient did very well Face and hands healed without scarring
2	30	Hands and face	2nd and 3rd	Healed rapidly No scarring or deformity (see figs 1 2 3 4)
3	17	Neck, face, back of hands and legs	2nd 3rd and 4th	Healed well Slight contraction of ring finger on both hands due to depth of burn No scarring on face
4	25	Face neck trunk and limbs	2nd 3rd and 4th	Had profuse hemorrhage from face fourth day after admission which kept up for two days. Healing delayed There was some scarring of the upper part of the face due to the hemorrhage and extension of both eyes Hands and legs healed quickly (see figs 7 8 9)
[illegible]	27	Face, scalp limbs and back	2nd 3rd and 4th	Burns very extensive and septic on admission Died five days after admission
6	19	Face back and hands	2nd 3rd and 4th	Right hand was skin grafted over the dorsum Healed well No scarring of face. No deformity of hands
7	42	Face and hands	2nd and 3rd	Healed well No scarring or deformity
8	20	Face and hands	2nd and 3rd	Healed rapidly
9	19	Face and hands	2nd and 3rd	
10	26	Face and hands	1st and 2nd	—
11	29	Neck on right arm	1st and 2nd	—
12	31	Right side of face	2nd and 3rd	
13	24	Face neck and hands	1st and 2nd	
14	37	Face and hands	1st and 2nd	
15	33	Face and arms	1st and 2nd	— —
16	18	Face neck and hands	1st and 2nd	—
17	29	Face scalp and hands	1st and 2nd	
18	[illegible]	Face neck fore arms and hands	1st and 2nd	
19	31	Hands and face	1st and 2nd	—
20	35	Face and right hand	2nd and 3rd	
21	29	Both arms	2nd and 3rd	
22	32	Face and hands	2nd and 3rd	

FORTY CONSECUTIVE CASES [illegible]

No.	Age	Situation of burn	Degree of burn	[illegible]
23	21	Both hands	2nd and 3rd	Healed rapidly
24	17	Trunk legs and face	2nd and 3rd	Very extensive burn Died eight hours after admission from shock
25	20	Face arms and back	2nd 3rd and 4th	Very extensive burns Died sixteen hours after admission from shock
26	22	Head face and back	2nd 3rd and 4th	Also shell wound opening up right knee joint Died six hours after admission
27	18	Neck face and hands	2nd 3rd and 4th	Also compound comminuted fracture of right tibia involving knee joint Shell wound left ankle opening up joint Moist gangrene appeared in right thigh Patient was in too grave a condition to amputate Died five days after admission
28	25	Face scalp hands and legs	2nd 3rd and 4th	Hands healed well The hair grew well on the scalp There was considerable scarring of face due to continued use of picric acid dressings (see fig. 5 and 6)
29	17	Face head neck and hands	2nd 3rd and 4th	Was suffering from shock for several days after admission Both hands and part of face were also grafted Ectropion of both eyes Hands healed well
30	25	Both arms	1st and 2nd	Healed well No scarring Good movements of joints
31	50	Face neck arms legs and hands	1st and 2nd	Healed quickly
32	28	Right hand	2nd and 3rd	Also septic shell wound of right foot and leg Burns healed well
33	21	Face and right hand	1st and 2nd	Healed well
34	18	Face neck and arms	1st and 2nd	[illegible]
35	29	Face neck and both hands	1st and 2nd	Extensor tendons but healed well
36	21	Face and back of left hand	1st and 2nd	Healed well
37	19	Face and hands	2nd and 3rd	[illegible]
38	21	Face hands and trunk	1st and 2nd	[illegible]
39	18	Face right arm and left forearm	2nd and 3rd	[illegible]
40	41	Right hand	Scald 3rd degree	Healing slow at first but subsequently result excellent

It is a familiar fact that prognosis in a burn case is determined not so much by the degree as by the area involved; but burns of the third degree however extensive if compatible with life may and should heal without deformity and with good function The first aim should be to obtain rapid healing and thus reduce the amount of scar tissue formed, and the second to prevent the possi

bility of [illegible] [illegible] separation of the sloughs—two or three weeks—cannot be materially shortened Some of our cases were treated with eusol others with saline normal and hypertonic others with fomentations and the rest with the emulsion mentioned above All the cases treated with the emulsion healed more quickly were more contented and comfortable and had no scarring Figs 1 to 1 are of a case so treated, they are photographs taken by Fleet Surgeon P H M Stan, R N, from Case 2 in the preceding list

From the above list it can be seen that nine cases of fourth degree burns were admitted and out of these four died Of the four cases that died three died of shock within twenty-four hours of admission to hospital, the other case died five days after admission from moist gangrene of right thigh, both legs were broken and his condition was too bad for operation All the cases received after the Jutland action were septic this was the case also on board H M S Tiger [1] yet Staff Surgeon Willan [3] had three cases of fourth degree burns on board R N Hospital Ship ' Plassy which remained aseptic and did well It is hard to imagine a burn of the fourth degree aseptic and remaining so during healing because the whole thickness of the integument of the skin is destroyed as well as part of the subcutaneous tissues All fourth degree burns were skin grafted Thiersch s method was employed no dressings were applied on top of the grafts, a wire cage was fixed over the hand or face and the patient was kept in the sunshine as much as possible By this method the grafts took very well and there was very little serous exudate under them A fourth degree burn of any size will not heal without extensive scarring or deformity unless it is skin grafted because in such a raw surface a point will be reached where the epithelium refuses to grow further over the granulations or if it does the scar is weak and breaks down into an ulcer on the least irritation, the reason being that the blood supply of the central part of the cicatrix is impaired by the contraction of the scar tissue

A point to be remembered in the treatment of burns is the probable deformities which will result from cicatrization It is a common observation that great deformities and serious interference with function frequently follow extensive burns of the extremities, especially when they involve the region of joints Burns of the axillary region leave contracting scars that draw the arm against the body, preventing more or less completely abduction of the affected limb Burns of the groin cause flexion of the hips on the body Burns about the elbows and knees produce only flexion

[illegible] the flexors [illegible] the con[illegible] extensor s[illegible] fingers the [illegible] rule holds [illegible] suffices produce much less interference with function by scars in these regions Scars following burns at the ankle are more likely to produce equinus than calcaneus, and lateral deformities are apt to be caused Burns of the feet and toes are likely to be much less serious on account of their deformities than on account of the scar tissue interfering with the normal weight bearing function Deep burns involving muscles joint structures and bones or causing complete loss of members, from the very nature of the primary injury can offer only such imperfect recoveries as are compatible with similar destruction of tissue from other causes Here the destruction is so great that the muscles and joints are no longer adapted to their proper functions, and even amputation may be necessary

For the last three months all cases of burns and scalds arriving at the R N Hospital, Queensferry, have been treated with paraffin wax but as the number of cases so treated is small nothing very much can be said for or against such treatment The 'Ambrine outfit supplied to all ships of the Navy is very compact and full instructions are given as to use (see also the *Lancet* February 3 1917)

Cases treated with ambrine heal quickly and with little scarring the application and removal of the wax seems to be quite painless

Before I draw up my conclusions on the treatment of War burns, I should like to thank Fleet Surgeon P H M Star not only for kindly taking the photographs of several cases for me but for giving me every facility and encouragement in my work

Conclusions

(1) The keynote of treatment is 'hands off' No dressings should be applied fresh air and an oily preparation being all that is required Hæmorrhage is rarely seen under such treatment

(2) War burns must be treated as septic burns

(3) Cases of fourth degree burns do not as a rule die of sepsis but of shock

(4) As a first dressing picric acid has few advantages over such a dressing as eucalyptus vaseline spread on lint, or a paraffin preparation

(5) Continuous saline baths are excellent for burns of the extremities and very soothing

(6) Vaccine treatment is a very useful adjunct in cases of septic burns A dozen cases were treated with excellent results

(7) For the treatment of shock 20 to 30 minims of a 1 in 1,000 solution of adrenalin hydrochloride were given hypodermically and repeated hourly

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A YEAR'S EXPERIENCE OF EUSOL AS A GENERAL ANTISEPTIC IN H.M.S. "LION"

By Fleet Surgeon ALEXANDER MACLEAN DSO, MB, RN
and
Surgeon HORACE L. R. STEPHENS MB, RN

The methods adopted for the prevention and treatment of sepsis are undergoing a progressive change, the importance of which is difficult to estimate. Consequently, a brief summary of a year's experience with a recently introduced antiseptic may be of interest.

Before August, 1914, we had little knowledge of the terrible injuries which modern guns and high explosives produce. Few could imagine the nature and severity of these inflictions, which are necessarily complicated with the worst degrees of suppurating infection. At that time wounds were treated "on general surgical principles," but the details of technique and the application of dressings were many and diverse in accordance with the individual ideas of the surgeon. Some advocated strong caustics such as mixtures of perchloride of mercury and carbolic acid, others believed in mild lotions such as boric acid, permanganate of potash and peroxide of hydrogen, while a few pinned their faith to Wright's principles of free lavage with hypertonic solutions. The large number of casualties and the gravity of the lesions have provided the necessary stimulus towards improving our mode of procedure. The literature on the subject has grown by leaps and bounds and still there is no infallible remedy. Nevertheless, we learn from clinical reports, our only reliable source of information, that wounds of all descriptions heal quicker, that sepsis is coming more and more under control and, consequently, a greater number of lives are being saved. This happy result may be considered as being due to several factors, such as:—

(I) The general advance in surgical methods especially in the treatment of special forms of injury, such as wounds of the abdomen and chest.

(II) The progress of investigation of the treatment of infected wounds, thus: (*a*) The application of hypertonic saline, (*b*) the introduction of antiseptics which are non-irritating, but at the same time powerfully bactericidal. In the following notes we give our experience of eusol, a solution of hypochlorous acid prepared from bleaching powder and boric acid, which exemplifies a potent non-irritating antiseptic.

Eusol has been in constant general use for a year in this ship and has been employed in the treatment of every variety of wound Much may be learned from the manner in which small wounds heal If these do well there is no reason why larger ones should behave differently At this point we wish to emphasize that it is not our intention that this account should appear in any way dogmatic The facts alone are recorded so that the reader may infer

Although this solution of hypochlorous acid has been used so freely we have not closed our eyes to the value of other antiseptics Thus carbolic acid has always been used for the solution in which instruments have been kept after sterilization Tincture of iodine has been often applied once the wound is clean and requires hardening while boric lint and izal have found a place in their respective spheres

Wounds have been divided into three groups, namely —

(a) Those which were brought to the sick bay immediately after the accident had occurred (b) those in which pus and other visible signs of sepsis were evident, (c) those received in action on May 31

In Class (a) thirty seven cases of all descriptions were placed on the sick list They averaged four and a half days sickness The routine admirably carried out by the sick berth staff, has been to wash every wound *freely* with pure eusol Sutures were placed where required and a 1 in 2 eusol dressing applied Every case healed by first intention No sign of pus has appeared in any case so treated Three typical examples are described —

(1) A H aged 23 stoker, June 17 Contused lacerated wound, 5 in in length, below left knee, very dirty caused by falling against sill of doorway dividing fibres of tibialis anticus and tearing periosteum of tibia Routine treatment four sutures inserted back splint with foot piece June 18 wound dressed, edges clean and red oozing clear serum, tenderness of pain marked June 22 sutures removed Healed with thin linear scar

(2) O N J aged 41 stoker R N R October 23 Whilst peeling potatoes knife slipped cutting dorsum of third and fourth fingers right hand dividing extensor tendons Tendons were united with catgut sutures and wound closed Eusol compress Palmar splint Complete recovery

(3) H L aged 25 Lieutenant R N May 12 Contused scalp wound 1½ in in length over lambda, bone visible for whole length Treatment, swilled with eusol and closed with two silk sutures Eusol 1 in 2 compress This had healed in thirty six hours May 14 inert iodine and no dressing

In Class (*b*) the number of septic wounds that came under observation was twenty four These averaged eleven days sickness In these cases perhaps the most striking feature is that immediately after treatment has begun the inflammation settles down and shows no tendency to spread The cusol has been applied in varying strengths to meet the needs of each case There can be no fixed rule in dealing with such a variety and one might add that results depend essentially on the intelligent application of the antiseptic Two instances with details are appended

(1) G H aged 18 ordinary seaman Septic wound between fourth and fifth toes of left foot on the plantar surface with marked cellulitis of the dorsum The pus had a peculiar offensive odour, and the inflammation was very acute The wound was carefully cleaned, being very tender and cusol compresses 1 in 2 applied every three hours Two days later the œdema on the dorsum had disappeared and the ragged bare surface showed both edges and base covered with healthy granulations The rapidity with which the infection was abolished was exceptional considering the difficulty of applying the dressing to the site Here we consider the prime factor in recovery was the *frequency* of application

(2) J D aged 30 stoker May 3 fell on railway line ashore, sustaining a lacerated wound 2 in long curving round the inner side of the left orbit just missing the lachrymal caruncle Treated ashore hair horse-hair sutures inserted Coma to sick bay May 5 Whole of orbit was acutely inflamed palpebral aperture almost closed owing to œdema of lids thick yellow pus escaped from the edges of the wound conjunctiva inflamed, and œdematous scarlet red in appearance. Treatment the four sutures were removed and the infected area attacked The conjunctiva was irrigated with a 1 in 5 solution of cusol made up with normal saline The yellow slough at the base of the wound was treated with cupad This caused some pain, which lasted two or three minutes The slough was cleared by May 8 and healthy granulations were apparent growing from the bottom Gradually the cavity filled up and on May 15 tincture of iodine was applied The conjunctivitis in like manner cleared up, finally being bestowed by drops of 0 5 per cent. protargol Duty May 19

Class (*c*) comprises fifty-seven cases of wounds and burns received in action A brief account has already appeared in a previous issue of the Journal but further details may prove of interest, since, after action, the wounded are discharged immediately on arrival at the base, and so the acquisition of a satisfactory "after-history" becomes a difficult matter We append in full the particulars of fourteen of our most severe injuries as a relatively small proportion of the whole

Cusol was the only antiseptic employed in dealing with wounds, many of which were treated without the preliminary cleansing with soap and water The surgical toilet might be truthfully described as rough and ready—the natural sequel of the limited

	Rating	Injury	Condition of wound	Condition on leaving R.N.H.S. Plassy
1	Stoker	Amputation middle of right leg, three sutures for flaps	Aseptic	Excellent will have a good useful stump
2	Stoker R.N.R.	(1) Lacerated scalp wound exposing right occipital bone (2) multiple burns first to third degree	Both aseptic	(1) and (2) almost healed
3	Cook's mate	Scalp wound frontal area, contusion left side	Aseptic	Healed
4	A.B. R.F.R.	(1) Wound left leg (sutured and drained), (2) wound left buttock piece of shell still in (3) burns of head and hands first to third degree	All aseptic	(1) Healed (2) will require removal of shell (3) almost healed
5	Stoker	(1) Burns face and hands first to third degree (2) abrasions, multiple	Aseptic	(1) Almost healed (2) healed.
6	Shipwright	(1) Scalp wounds and left frontal sinus (2) burns head and hands, first to third degree	—	(1) Healed (2) almost healed
7	Stoker	Burns, face	—	Healed
8	Off. Steward	(1) Long lacerated wounds both thighs both sutured, tube left thigh (2) deep lacerated wound of outer side of right knee	(1) Aseptic (2) aseptic	(1) Healed, (2) granulating satisfactorily

9	Feeding stoker	(1) Large lacerating wound left calf exposing muscle (2) perforating wound into right metatarso phalangeal joint	(1) Aseptic (2) very septic	(1) Granulating satisfactorily (2) piece of shell removed doing well
10		Long deep lacerated wound anterolateral aspect of left thigh drained by tube	Acutely septic	Still some sloughs to come away doing well
11	Stoker	(1) Compound fracture left tibia and fibula into ankle joint large cavity (2) lacerated wound inner side of great toe (3) injury to scrotum of left thigh	(1) Offensive and acutely septic (2) septic (3) septic	(1) Pieces of cloth removed sepsis got ahead of foot should be saved (2) almost healed (3) hernia of left testis sloughs still to separate.
[illegible]	Ordinary seaman	Compound fracture of left femur into knee joint with transverse fracture of patella left	Acutely septic	Pieces of cloth removed from wound probably sepsis has been got ahead of *N B* —This leg was saved
13	Stoker	Compound fracture of left tibia and fibula fracture gangrenous soon after admission	Offensive and acutely septic	Amputation done without flaps healthy granulating wound
14	[illegible] stoker	(1) Outer aspect of left foot blown away exposing os calcis and tarsal joint (2) compound fracture terminal phalanx of right great toe	(1) Acutely septic (2) aseptic	(1) Pieces of cloth removed from wound probably sepsis has been got ahead of (2) will soon be healed

amount of time at our disposal. Consequently, in order to arrive at a just decision on the value or otherwise of our fight against sepsis we must consider the exceptional conditions under which the operations were performed, such as the heavy casualties among our staff, the lack of water at the outset, the long period the wounded lay with only cyanide gauze applied, and our prime object, viz., to render surgical aid to every one as soon as possible.

Some of the septic cases are doubtless due to our faulty technique, as in three instances pieces of clothing, and in two a piece of shell was left in the wounds. We frankly acknowledge such gross errors, but have no hesitation in placing them on record as bare facts. At any rate the results give us sufficient encouragement to persevere and try to improve when the next opportunity presents itself.

The preceding table was drawn up by Staff Surgeon R. T. Willan, M.V.O., R.N.V.R., on June 11, 1916. We feel greatly indebted to him for the trouble he has taken at a time when work was at full pressure.

Boils.—Twenty-eight cases have been treated, the average number of days sickness being six. The routine in these cases has been a free incision, followed by the application of eupad to the slough. Once the "core" has come away, the cavity has been syringed with eusol. Perhaps the most noticeable feature has been the rapid disappearance of the surrounding brawny induration of the tissues. This is probably due to the toxins themselves being broken up and rendered inert by the nascent chlorine and oxygen. Eupad should be used sparingly in such cases, as in any bulk it exerts an extremely powerful action.

Abscess.—Thirty cases have come under observation, each averaging five and a half days sickness. Routine after a free incision the cavity has been syringed out with pure eusol every two or three hours. Whitlows recovered quickly, and we observed that lymphatic sequelæ were conspicuous by their absence. One interesting case occurred which shows that a septic focus can be sterilized provided the patient can supply the necessary recuperative power.

W. S., aged 23, leading seaman. April 15. Abscess on inner side of left upper arm over commencement of brachial artery, about the size of a walnut, quite localized, some indurations of tissues around. Treatment: incised and about three drachms of thick serious pus evacuated, cavity syringed with pure eusol every two hours. April 17, the cavity appeared clean. At the bottom could be clearly seen a healthy crimson red lining. The edges over which the pus had poured were "tacky"

with scrum [illegible] tooled like the edges [illegible] ruling, smeared with solution inviting adhesion [illegible] brought them together and they healed as though in aseptic incision [illegible] Even this sanse. April 19 tincture of iodine and dry dressing April 20 Duty

Alveolar Abscess—Five cases were treated each [illegible] four days sickness. In this connection we consider cresol forms an extremely efficient oral antiseptic even when diluted [illegible] times. In cases of pyorrhœa alveolaris the fœtor of the breath disappeared as if by magic

Tonsillitis Follicular—Twelve cases were recorded each averaging four days sickness Routine treatment consisted of a thorough swabbing of the lacunæ with pure cresol combined with a constant use of a 1 in 10 mouth wash We consider the time in recovery is diminished by this energetic local attack on the disease It is a peculiar fact that these cases which usually occupy a prominent position in the nosological returns have been greatly reduced It may be pointed out that it has been the practice to swab the throats of all men joining the ship Perhaps this may partly account for our comparative freedom from infectious diseases.

Venereal Diseases—Only a few sporadic cases have occurred Our experience has not been sufficient to enable us to form a definite conclusion So far as they go the results have been satisfactory

Two cases of chancroid healed under applications of cupad They cleaned quickly and soon lost that yellow velvety base which is so difficult to remove Three cases of gonorrhœa did well with local injections beginning with 1 in 10 diluted with normal saline gradually increasing to 1 in 5 Two cases of tertiary specific ulcers healed well The most striking feature in both cases was the substitution of healthy granulation tissue for those pus exuding surfaces

We have applied cresol unsparingly not only to the cases detailed but for general swabbing of throats and gargles for washing slums—in fact, wherever a bacteriocidal effect was required It has been no trouble to make, and the cost has worked out in this ship at 8¼d per month The introduction of this antiseptic is, therefore, of interest from its mere economy The phenol derivatives are both expensive and difficult to obtain whereas the outlay required to procure cresol is negligible

Contrary to the experience of some we have never found cresol solution cause pain Cupad powder however, always produced a temporary smarting unless a slough intervenes if applied in

excess [illegible] complained of, w[illegible] in [illegible] is any [illegible] is generated Pain [illegible] therefore an indication that [illegible] too strong a solution or too much powder has been employed

At the outset we were inclined to be sceptical of the true worth of hypochlorous acid as an antiseptic but the hard facts of clinical evidence have convinced us that we possess in this an extremely powerful weapon in our daily fight against sepsis. It cannot be doubted that HClO is one of the most formidable enemies of pathological micro organisms This characteristic quality, however, is short lived; and this is the vital point where it differs from such substances as perchloride of mercury and metallic salts Once the HClO is broken up, there is nothing left Hence we see the practical necessity of repeated application in septic wounds For the fresh wound the one thorough dose suffices

We believe that sepsis throughout the ship has undergone a marked decline The healthy wounds the small percentage of tonsilitis and sore throat, together with a relative immunity from the specific exanthematic cannot be due to a mere coincidence A great variety of diseases set in with an indefinite sore throat We believe our practice of swabbing the throats of all men joining the ship, together with the application of eusol to cases of sore throat occurring on board, form an important element in the prevention of infection

It may be of interest to note that we now possess four distinct methods at our disposal to attack sepsis viz —

(1) The solution eusol, for open wounds and washing out cavities, (2) the powder eupad, for sloughs and very septic tissues (3) the intravenous injection of eusol in saline for toxæmias and septicæmias [1], (4) eusolized vaccines, which have just been introduced by Dean with promising results [2].

Perhaps this brief account of a year's practical work on board a large ship may encourage others who are not quite satisfied with their present methods, or even those who have failed at first in the employment of the method we recommend

In conclusion, we wish to express our indebtedness to Professor J Lorrain Smith for his kind assistance and guidance for without these our own efforts could not have produced that sense of security, of being on the right path which we now fully realize

REFERENCES.

(1) *Brit Med Journ*, November 13 1915, *Ibid* January 15 1916 *Ibid* March 18 1916

(2) *Brit Med Journ* April 29 1916

THE EARLY DIAGNOSIS OF SYPHILIS IN THE NAVY

BY [illegible]

Assistant Director of [illegible] at the Royal Naval Hospital [illegible] the Medical [illegible] (Instructor)

AND

FLEET SURGEON J. S. DUDDING, R.N.

At a time when the civil population of the country is beginning to realize the value of organization in dealing with venereal disease, it may be of interest to Medical Officers to review the question of syphilis as it affects the Navy.

Syphilis in the Navy differs materially from syphilis as seen in a civil hospital, in that in the former there is an enormous preponderance of early cases, while in a civil hospital tertiary syphilis is more commonly observed than acute syphilis. This is chiefly due to the fact that the average age of patients in a naval hospital is much lower than in a civil hospital. The proportion of early cases in the Navy is also no doubt increased by the instruction given to the men upon these questions, and also by the penalties exacted for concealment of disease.

This preponderance of early cases is, of course, a great advantage to the Naval Medical Officer. Practically all fresh cases of syphilis should come before him in the early primary stage, and therefore it is in his power to cure permanently the great majority of cases. It is no exaggeration to say that the most obvious of all the lessons to be learned from modern advances in knowledge of syphilis is the paramount importance of the earliest diagnosis.

It may be said that the problem of syphilis as it presents itself to the Naval Medical Officer is the problem of early diagnosis, and therefore we propose to confine ourselves to this question in the present paper.

When the Medical Officer is confronted with a venereal sore of whatever nature, his chief concern is not to cure the sore but to establish or exclude the possibility of a syphilitic infection therein while the disease is still in its early stages and long before there are any signs of generalization. If this fact were thoroughly grasped and acted upon there would be at once a material diminution in the number of days' sickness from syphilis, and also a material diminution in the wastage of valuable trained men in later years from syphilitic-vascular, and nervous diseases.

As is w[illegible] two methods for arriving at a diagnosis in [illegible] the detection of *Spirochæta pallida* in the [illegible] the application of the Wassermann test to the blood. Of these two the former, the examination of the sore, is far the more important. By this method the diagnosis may be established in the earliest stages of the disease, while the Wassermann reaction does not become available for some weeks after infection owing to a prolonged incubation period. Again, the discovery of *S. pallida* in a sore is certain direct evidence of primary syphilis, while the discovery of a positive Wassermann reaction is only evidence of syphilis generally and not necessarily of primary syphilis.

We are of opinion that these facts are not generally known to all Medical Officers. Week after week we have instances of lack of appreciation of the capabilities of these tests. We have men sent to hospital for Wassermann reactions with soft sores on the penis within a few days of infection, and upon the result being reported negative, no further effort is made to exclude syphilis, and the man returns later with a secondary rash. Further, men are repeatedly sent to hospital for blood tests with sores on the penis which have been treated with "black wash", in fact they are often only sent when the "black wash" treatment has proved ineffective after several weeks. Such cases are often too recent to give a positive Wassermann reaction but a diagnosis could be made at once by the discovery of *S. pallida, were it not for the presence of the antiseptic.*

It is no exaggeration to say that every week we see several instances of men with syphilis who have been allowed to progress from the early curable stage to the later less curable stages, merely because the Medical Officer does not fully appreciate the details of procedure which it is essential to follow to arrive at the earliest possible diagnosis.

We therefore propose to deal with these matters in some detail.

Methods available for the Diagnosis of Syphilis in Venereal Sores.

Before the recent advances in the diagnosis of syphilis, the only method available for establishing the syphilitic nature of a sore was the clinical method of inspection and palpation. By the presence or absence of induration for instance, the surgeon sought to establish or exclude a syphilitic infection. It was, however, even

[illegible] up to a short time ago to withhold the syphilitic [illegible] until the diagnosis had been confirmed by the appearance of secondary symptoms. Under these circumstances we do not propose to discuss questions of clinical diagnosis. Instead of attempting to differentiate sores by these means the Medical Officer should look upon all venereal sores as potentially syphilitic until he has strong evidence to the contrary.

The methods of diagnosis which we shall discuss therefore are the detection of *S. pallida* in the sores and the Wassermann reaction. It will facilitate the subsequent account if we describe shortly our classification of venereal sores from the point of view of the diagnosis of syphilis.

We recognize only two varieties, which may be called—non-septic and septic. The non-septic venereal sore is one in which there is no purulent discharge and no sloughing ulceration, and in this category is the typical "hard sore" or Hunterian chancre.

The septic venereal sore on the other hand is one which discharges pus more or less copiously, and which is associated with sloughing ulcers. These are due to numerous varieties of micro-organism probably working in association and not to any one strain which may penetrate into the surrounding tissues. We do not for instance look upon the "soft sore" of Ducrey as differing essentially from other "soft sores." We classify all these lesions as "septic venereal sores," and *any of these may contain S. pallida.*

The Detection of S. pallida in Venereal Sores.

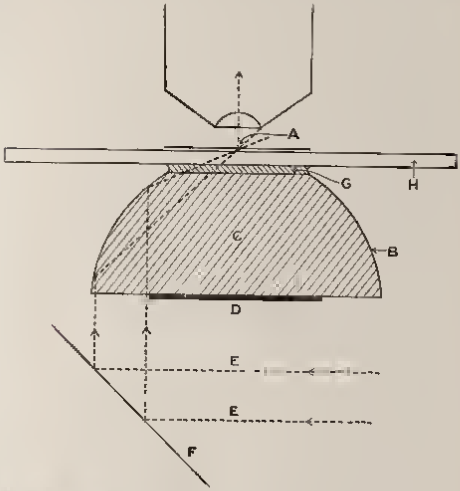
There are two recognized methods for carrying out this process, although one is far superior to the other. They are the method of "dark ground illumination" and the "indian ink" method. The former is the more satisfactory.

Dark ground Illumination.

In this technique the spirochaete is viewed in a living state suspended in a wet film under a cover glass. By means of a special substage condenser fitted to the microscope the suspended objects are intensely illuminated by extremely oblique rays, all direct rays being prevented from passing through to the microscope. Thus the spirochaetes and other particles are found brilliantly lit up as silvery objects against a dark background. The special con-

denser occupies the position of the ordinary substage condenser. The best type is that of Zeiss and other instruments upon the market are founded upon Zeiss's design.

The construction and design will be apparent from the figure.



[illegible] of the [illegible] of a parabolic curve B [illegible] the condenser with its circumference cut so that it forms part of a para[illegible] [illegible] then silvered [illegible] permitting the passage of direct rays through the condenser [illegible] falling on the mirror F and passing to all the periphery of D to [illegible] the side of the parabolic condenser C. All such rays will focus in the [illegible] of the curve and this is adjusted to coincide with the position of the [illegible] between the condenser and slide (H) so that rays will pass straight [illegible] without refraction.

Technique—The apparatus required is as follows —

(1) A strong source of light. A small arc lamp is satisfactory for this purpose A convenient type is that in which the carbons are shielded in a metal tube carrying at the end a bull's-eye lens for converging the rays Messrs W Watson and Sons Ltd., 313 High Holborn, London, W C supply a lamp of this type We ourselves use a Royal Ediswan 'Pointolite' lamp This is supplied mounted as for a lantern and fitted with a good reflector It gives an intense focal illumination which never varies and is better suited than an arc for a permanent installation

(2) A microscope fitted with $\frac{1}{6}$ in lens (not $\frac{1}{12}$-in as is usually suggested)

(3) Dark ground condenser—also supplied by Messrs Watson

(4) Cedar-wood oil

(5) Glass pipettes drawn out *very* fine Rubber teats to fit

(6) Clean coverslips

(7) Clean *thin* slides

Method—(1) The lamp is lit and its rays concentrated upon the mirror of the microscope

(2) Clean a slide and coverslip and place both upon a piece of paper

(3) Take a fine pipette with rubber teat

(4) Examine the sore Clean up if necessary with a little damp wool held in forceps

(5) The patient *himself* now squeezes out a little fluid from the sore A very small quantity is all that is necessary avoid blood as far as possible

(6) Take up this drop of fluid in the pipette The exudate may be stimulated by lightly scratching with the pipette, but do not get a lot of blood

(7) Blow out the drop of fluid on to the coverslip

(8) Place the slide down on the coverslip, which may then be picked up by capillarity Tap the cover glass to spread the film well

(9) Put a drop of oil on the *under* side of the slide and upon the upper surface of the condenser

(10) Rack down the microscope condenser Place slide on stage Rack up the condenser to the top when the oil on the slide will coalesce with that on the condenser

(11) Adjust the mirror so that the maximum amount of light passes through the condenser

(12) Rack down the microscope into focus

(13) Again adjust the mirror for the best effect

Results.—By this method the *S. pallida* is seen as a small refractile undulating filament. It has in reality a corkscrew shape but this is hardly apparent with a $\frac{1}{6}$-in objective. The spirals however, give rise to the appearance of a "chain of cocci" sometimes referred to, the cocci being where the light catches the top of the undulations. The undulations of *S. pallida* are regular in size and spacing; their number is very variable and thus the length of the organism also varies. Usually it is about 50 per cent longer than a red blood corpuscle but what is more important is the fact that about seven undulations correspond to the diameter of a red corpuscle. The movement in a forward or backward direction is seldom obvious; neither is it easy to see with a $\frac{1}{6}$ in lens the spinning of the organism upon its long axis. The most characteristic movement is a wobbling flexion or waving of the extremities from side to side.

Other elements recognizable in such a preparation are pus cells, loaded with coarse refractile granules which are often in a state of active Brownian movement; red blood cells, seen as a transparent disc with a refractile edge; cocci and bacilli. It is also necessary to mention that other spirochætes than *S. pallida* may be found in ulcerated sores and especially in balanitis and these must of course be recognized as non-syphilitic. After a little practice there is usually no difficulty in differential diagnosis. The commonest non-syphilitic spirochæte is *S. refringens*. This organism is much coarser than *S. pallida*; its spirals are very irregular in size and spacing. It often moves obviously forwards or backwards and does not possess the slow flexion movements of *S. pallida*.

Applicability to Service afloat.—It is often stated that microscopic work is rendered difficult or impossible by vibrations and oscillations of the ship. This is no doubt so in small ships but it is not suggested that this apparatus should be supplied to all.

The dark ground apparatus is peculiarly insusceptible to vibration, and even if there is a certain movement in the preparation this does not constitute a difficulty. It is quite easy to recognize *S. pallida* as it passes across the field in a current. Fleet Surgeon Kilroy has used a dark ground apparatus in his ship and has found no difficulty in working it satisfactorily. Finally the extra stores required in addition to the microscope condenser are trivial, consisting of one small arc lamp and a number of glass pipettes. These involve very little extra space for storage.

The Indian Ink Method

In this process the spirochæte is viewed dead in a dry film. The organism is not stained but is rendered visible by being embedded in an opaque film of Indian ink. The spirochæte (and other suspended matter) displaces the ink and thus shows up as a clear halo in the continuity of the film. It is not proposed to enter into details of technique in connection with this method. In general a "loopful" of exudate from the sore is taken and mixed with a "loopful" or more of ink at one end of a slide. A film is then spread in the same manner as a blood film. The slide is then examined under the $\frac{1}{12}$ in objective.

For use in ships this method has the advantage of requiring no apparatus except a bottle of ink. On the other hand, in addition to many disadvantages, vibration when using the $\frac{1}{12}$ in objective would render the image already indistinct, very difficult to detect accurately.

A Comparison between the Dark Ground Method and the Indian Ink Method

Objection to the indian ink method is divisible under two main headings.

With regard to the distinctness of the image, the indian ink film is often very indistinct and requires quite exceptional concentration and microscopic skill to detect the fine undulations on the brownish or yellowish background; on the other hand by the dark ground method the spirochætes can hardly be overlooked.

It is a commonplace among those who have experience of the two methods that on very many occasions spirochætes are found immediately in the first field examined by the dark ground method and are never found at all in the ink film. Therefore in any place where syphilitic work is done and an arc lamp can be installed the dark-ground apparatus is always used.

The other objection is based upon the distortion which is incidental to most film methods and upon the fact that in the ink film the organisms are dead. The characteristic evenness and regularity of the undulations of *S. pallida* may be so distorted as to resemble those of *S. refringens*. The characteristic thinness of the filament is altered according as it is buried or not by the thickness of the ink film. Finally the characteristic movements cannot be observed. It therefore follows that *S. pallida* can never be diagnosed with such a degree of certainty as by the dark ground method.

We are well aware that the indian ink method is often used in the diagnosis of primary syphilis and have attributed a great deal of incorrect diagnosis to this use

The importance of the spirochæte examination is just as great in the case of "negatives" as "positives" A "positive" by the indian ink method has a certain degree of value in diagnosis but a negative has no value at all in excluding syphilis, and in this respect it differs entirely from the dark ground method

We have often seen cases in which the medical officer has presumed the absence of syphilis because he could not find *S pallida* by the ink method Such cases are deprived of the advantage of early treatment We have also seen cases in which *S pallida* was confused with *S refringens* We are therefore prepared to say that in our opinion more harm than good arises out of the use of indian ink in the Navy, and that it would be better to make no examination at all for spirochætes than attach undue importance to this method

The Wassermann Reaction

This is a method for detecting certain alterations which take place in the serum of a patient as the result of a syphilitic infection The changes in the serum are in the nature of "immune" reactions to an infection by *S pallida* in the same way that "immune" reactions take place in the serum of patients infected with *B typhosus*

The important characteristic of "immune" reactions which affects the present subject is the incubation period The Widal reaction has an incubation period of about three or four weeks, that is to say it is not detectable until some three or four weeks have elapsed since infection therefore it is useless to perform the Widal test within four weeks of infection for the purpose of diagnosing typhoid fever Similarly the Wassermann reaction has an incubation period which persists for some four to six weeks after infection Therefore the test is not applicable for the diagnosis of syphilis within four to six weeks of infection

Another point upon which it is desirable to lay stress is that the Wassermann reaction deals with general blood changes it indicates that an individual has syphilis, but not that any suspicious lesion which he may present is due to syphilis The reaction has no value for regional diagnosis and thus if a man has a positive Wassermann reaction and a sore on the penis it does not follow

that this sore is due to syphilis In the Navy it is common enough to find an old syphilitic with a "chancroid

The Wassermann reaction therefore is not properly applicable to the diagnosis of syphilis in venereal sores for two reasons —

(1) It is negative in the first weeks of infection and thus does not provide the earliest means of diagnosis

(2) It only indicates "syphilis and not "primary syphilis for which conditions the treatment may be very different

Applicability to Service afloat—The Wassermann reaction is a highly complicated test which requires a considerable stock of laboratory equipment and further has little value unless performed by an expert It is therefore impossible to carry it out in ships unless an expert happens to be afloat under suitable circumstances Even then one of the modified techniques only can be performed

The medical officer in a ship can however collect the blood required for the test himself and post it to a Naval hospital for examination, but there are a number of precautions which should be adopted in order not to disturb the test Neglect of these precautions at the present time renders abortive a considerable number of tests upon bloods sent from ships

(1) *Collection of the Blood*—The blood should be collected into a Wright's blood capsule of suitable size and not into the minute bulbs which are intended for microscopic Widal tests nor into any glass tube which happens to be available Suitable capsules should be in every ship for this purpose The amount of blood required is 0 1 c c at least this is easily obtained by puncture of a finger or thumb The patient swings his right arm violently in order to drive the blood into his finger tips, and then the surgeon without delay winds a piece of narrow drainage tubing round the thumb from the base to the distal joint A couple of punctures are then made with a surgical needle just proximally to the thumb nail and towards the ulnar side The blood which escapes is taken up in the capsule in the ordinary way through the curved end If sufficient blood cannot be obtained in one application of the rubber tubing the arm may be swung again and the tubing re-applied Further punctures are unnecessary The straight end of the capsule should be thoroughly fused in a flame the curved end may be left open *The blood must not be burnt* The medical officer in order to obtain a report as soon as possible should acquaint himself with the day on which the tests are made at the hospital to which he sends the bloods If bloods are sent at the proper time a report should always be available in less than a week

If Medical Officers stationed [illegible] require blood tests to be made at a hospital in England [illegible] quite possible to obtain a satisfactory result under certain conditions The blood should be taken aseptically with a syringe by venepuncture It should be allowed to clot in a sterile vessel and when the serum has exuded this should be collected aseptically and sealed in a sterile capsule or tube Serum so collected in a sterile condition is quite satisfactory even when sent from the tropics

(2) *The Supply of Information*—In many cases the tester of the serum is considerably handicapped in adjudicating upon a doubtful result by being more or less entirely ignorant of the nature of the case which he is testing

If a result is reported from Haslar, for instance as '++++, there is no question about the significance of the result It means that the serum is completely positive But it sometimes occurs that degrees of inhibition of hæmolysis less than complete are met with, thus +++, ++, or + in which case the doubt arises as to whether these are certainly 'positive The only person capable of settling this question is the tester, since he is the best authority upon his own technique

Assume that the Medical Officer in a ship has a case of rash which he thinks may be secondary syphilis In the laboratory the reaction is found to be +, that is to say, a very slight reaction Now if the tester knew that it was a question of acute secondary syphilis, he would at once report negative because he knows that by his technique cases of acute secondary syphilis are always ++++ The case could not be secondary syphilis But if he had reported + the Medical Officer might think that this constituted a confirmation of his diagnosis and that the man had syphilis In point of fact the trivial inhibition might have been due to malaria or possibly scarlet fever

For these reasons the tester is very apt to disregard slight reactions when he is told nothing about the case, and the Medical Officer is then apt to lose the advantage of knowing about the slight reactions when he sends up cases under treatment, and to assume that the case is really negative when it is not It would thus be a great advantage if Medical Officers when sending bloods would also supply the salient details of the case

In Admiralty Order 268 1915 it is of course laid down that certain specific details should be sent with bloods, but unfortunately it does not specify that the actual state of the patient should be communicated Recognizing this omission, it is the custom of

[illegible] Meibel [illegible] is to give a short account of [illegible] their own words [illegible] details [illegible] always exactly [illegible] the facts [illegible] to know.[1]

We, the [illegible] are told the forms in which [illegible] would be [illegible] filled [illegible] to his patient [illegible]

VAN LEMANN LIST

Name [illegible] Date [illegible]
Sex [illegible] Age [illegible]

Present complaint [illegible]
Previous history [illegible]
Family history of [illegible]

[illegible]

Injuries [illegible]

Injuries [illegible]

Explanation of the Hypothetical Case.—[illegible] sore on the penis which [illegible] started about the [illegible] after [illegible] able for the spirochaete [illegible] and the [illegible] and his blood is sent for examination six weeks [illegible] This man had already suffered from syphilis three years [illegible] been treated with salvarsan before the appearance [illegible] symptoms. His Wassermann reaction had [illegible] It is now reported [illegible]—which is incomplete [illegible] certainly due to a [illegible]

Explanation of the Hypothetical Case.—The [illegible] with syphilis in December [illegible] No spirochaetes [illegible] out and he developed a [illegible] He was given to understand [illegible] of kharsivan and mercury. His Wassermann reaction [illegible] negative, and is still negative on the latest quantitative [illegible] upon the effect of treatment.

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[1] Since this article was written a [illegible] which contains the recommendations of a little office book [illegible]

WASSERMANN TEST

Name *Age* *Rating*

Ship (Large ship)

Present symptoms None

Probable date of infection December 1915

Previous date of spirochæta test None

Previous symptoms (if old case) Sore on penis and rash

Treatment

Date *Place* (Sore on penis)

Previous treatments—No. of doses 2 khavsivan

Dates January and February 1916

Mercury Continuously to date

Date of last test September 22 1916. *Where* Haslar *Result* Negative

Date December 31, 1916 *Signed*

Report Negative

THE RESULTS TO BE EXPECTED FROM THE METHODS OF DIAGNOSIS

When the Medical Officer proposes to apply the spirochæta test to a patient or to send his blood into hospital for a Wassermann reaction, he requires to know exactly what are the capabilities of these tests and what deductions he may draw from the result We propose to discuss the dark ground illumination method and the Wassermann reactions only, as already stated we do not look upon the Indian ink test as satisfactory

The Dark-ground Illumination Method—For success in applying this test, there is one essential which must never be overlooked antiseptic dressings must never be applied to a venereal sore before the test is made, neither must general antisyphilitic treatment be entered upon If antiseptic dressings have been applied even for a short time the value of the test is greatly diminished In the following account it is of course assumed that no antiseptics have been applied and no antisyphilitic treatment given

Different deductions follow from the result of the test according as the sore comes under the heading "septic" or "non septic" in our classification already mentioned

The Non-septic Sore—In non-septic sores *S pallida* is found with the greatest ease In every case coming under this category and due to syphilis the spirochæte should be found on first

examination In that case if the result of the examination is negative it is very strong evidence against the presence of syphilis

When such sores become older and indurated it is somewhat more difficult to find *S pallida* but even then given an entire absence of treatment, it is almost unknown to fail to find the organism

The Septic Sores—The degree of septic element in a sore has a great bearing upon the probability of demonstrating *S pallida* therein and this must be borne in mind when estimating the value of the test This is due to several causes

The first type of septic sore is that which occurs within a day or two of infection It is due to microbes other than *S pallida* but may contain *S pallida* accidentally If this variety of sore is examined too soon after infection *S pallida* may easily be overlooked, because they may not have had time to develop locally into sufficient numbers to detect A negative examination therefore at this early stage will give little evidence on which to exclude syphilis When the septic sore is somewhat older, say fourteen days old the probability of success will depend upon the amount of discharge which not only dilutes the spirochaetes, but by reason of the pus cells and debris renders their detection considerably more difficult Nevertheless if care is taken to remove all superficial exudates and to obtain as far as possible a fresh sample of exuded fluid, most cases which contain *S pallida* can readily be recognized

It is, however certain that *S pallida* is never so easily found in a septic case as in a non septic and therefore its absence on first examination cannot be regarded as strong evidence against a syphilitic infection It is important evidence but requires confirmation by several repetitions

Hidden Chancres—*S pallida* in chancres occurring in the urethra are readily demonstrated They are found usually in very large numbers and without any contamination in the clear fluid which can be pressed into the meatus In the case of chancres concealed under the prepuce in phimosis, there is usually a complication in the nature of balanitis This necessitates great care in differential diagnosis, enormous numbers of spirochaetes other than *S pallida* being present In dealing with such a case it will be best to remove all discharge by squeezing and then to take a sample from the fluid last expressed There is then little difficulty in finding *S pallida*

Resume—(1) Never apply antiseptics to venereal sores until

they have been properly diagnosed. Do not use antisyphilitic treatment.

(2) When a man arrives for the first time with a non-septic venereal sore, the presence or absence of syphilis can nearly always be settled at once by the dark ground method.

(3) When the sore is septic a single negative result should never be taken as excluding syphilis; always repeat, and when the sore has appeared very soon after infection do not repeat the examination too soon.

The Wassermann Reaction.—When a patient is suffering from a venereal sore, the Medical Officer should understand that even if he has a Wassermann test performed and this is positive it does not prove that this venereal sore is syphilitic. The Wassermann reaction can therefore give indirect information only.

If, however, the Medical Officer can satisfy himself that the patient has not previously contracted syphilis, a positive reaction will indicate that a sore on the penis is syphilitic.

Such cases are of course common in young men and therefore, the reaction has distinct value in the diagnosis of primary syphilis, especially when the sore has been improperly treated with antiseptics.

It is often stated that the reaction is seldom positive in a case of primary syphilis, but this is no longer the case with modern improvements in the reaction. The test is of course invariably negative before the appearance of a syphilitic sore, and when the sore is soft it is negative for some time after its appearance. Owing to the differences in the time of appearance of these lesions, it is better to calculate from the date of infection. At Haslar for instance, we have often found the Wassermann reaction becoming positive four weeks after infection but usually six weeks, and sometimes later, when the course of the disease has been rendered abnormal by the application of blackwash to the sore.

Perhaps a better indication of the value of the test is the fact that of all the sores in which *S. pallida* has been demonstrated during the past four months at Haslar 75 per cent have given a positive reaction.

When therefore the Medical Officer has a case which has been treated by blackwash treatment and the sore has been present for some weeks or is indurated, the Wassermann reaction may be of value to him. If it is reported positive he may conclude that the probability of primary syphilis is sufficiently strong to warrant sending the case for immediate treatment.

It is [illegible] of syphilis [illegible] on the [illegible] probably [illegible]

Since the [illegible] some six [illegible] a blood [illegible] so early [illegible] suggesting [illegible] tion [illegible] patient [illegible] develop [illegible]

Results.—[illegible] several weeks [illegible] indurated [illegible] obtained [illegible]

(2) There [illegible] within six weeks [illegible] infection

(3) A positive Wassermann reaction [illegible] of that a [illegible] syphilitic but [illegible] the patient is [illegible] discovered [illegible] spirochaete test the history must decide whether the result refers to the sore or to a past infection

Procedure in Dealing with a Case of Venereal Sore

The procedure to be adopted in dealing with a venereal sore will differ to some extent according as the man is in touch with the best methods of diagnosis or not. In the vicinity of the large naval ports and hospital ships and possibly in some of the larger ships all facilities should be available, while in smaller ships this may not be the case; therefore in such cases some modification may be essential.

(1) In the case of naval ports, hospital ships and large ships.

It is presumed that a dark-ground illuminating apparatus will be available in these cases.

On first seeing a case of untreated venereal sore of any nature an examination should be made by the dark-ground illuminator or the man should be sent to hospital for this purpose. No treatment should be applied to the sore except a saline dressing on white lint and no anti-syphilitic treatment should be given internally.

It should be remembered that in a case of phimosis a sore may be present under the prepuce and cannot be reached. In such cases the discharge itself should be diluted and examined, particular attention being paid to the differential diagnosis between *S. pallida* and the numerous other spirochaetes. If *S. pallida* is found in the

sore local and general antisyphilitic treatment should be applied at once and the man sent to hospital for further treatment If the result of the examination is negative, it should be repeated on at least two other occasions all treatment except calmic dressings being in the meantime withheld

The interval of time between these tests will depend upon whether the sore appeared a very short time after infection or not If, for instance, a sore is seen shortly after the infection and the first examination is negative it may be that the spirochætes have not had sufficient time to develop in detectable numbers In such a case the two further examinations should be made at intervals as long as possible, so that one at least is carried out fourteen days after infection If the sore is not very young, the three examinations may be made on consecutive days

If all three tests are negative the probability of a syphilitic infection is very slight and local treatment with antiseptics may be started without, of course, administering any antisyphilitic treatment

As to whether the Wassermann reaction should be carried out in these cases depends upon the length of time since infection If it is a recent case within four weeks of infection there is no necessity to carry out a Wassermann reaction, but if the infection has been present for over four weeks the reaction should be performed

If the result is positive it will mean that the man has syphilis, but not necessarily primary syphilis, and, therefore it will not necessarily be essential to send him for treatment immediately Whether he is a case of primary syphilis or not should be determined by the dark-ground test, but if for any reason, for instance a pronounced septic state of the sore, the spirochæte test is not looked upon as thoroughly satisfactory the case should be assumed to be primary syphilis and sent for treatment immediately

When the report of the Wassermann reaction is negative there is no diagnostic significance The diagnosis of the case rests upon the result of the spirochæte tests If however, these are negative and yet the sore does not heal under treatment it will be desirable to repeat the Wassermann test every fortnight up to eight weeks after infection

This type of case the untreated venereal sore, should represent the great majority of cases but if the sore has been treated with antiseptics by outside quacks the Medical Officer will have to be guided by the exact conditions before him The negative results of his spirochæte tests will be deprived of their value First the

spirochæte test should be tried, and if negative the sore should be repeatedly dressed with saline solution upon white lint for seven days After that time the spirochæte test should be reapplied and if negative repeated upon two occasions If still negative, it is practically useless to continue with these tests The patient will have to wait for a Wassermann test and this cannot be applied until four weeks after infection If the Wassermann test is negative then, it is possible that the case is not syphilitic but this result must always be confirmed by repetitions of the test The reaction should be repeated every fortnight until three months have elapsed since infection If the case remains with a negative Wassermann reaction for three months after infection it may be taken that the sore is not syphilitic and therefore the Wassermann reaction assumes great importance in the exclusion of syphilis

In the event of the first Wassermann test being positive the question again arises as to whether this implies syphilis or an older infection The Medical Officer may be guided by the past history if it is really definite and assume that the reaction is due to a previous infection but on the whole it will be safer to give the man the benefit of the doubt and assume that the case is one of primary syphilis He will then be sent into hospital for salvarsan treatment

On comparison between the procedure suited to an untreated sore and that suited to a treated sore, it is seen that in dealing with the latter there is great complexity and uncertainty The patient is kept from active duty for a long time before the diagnosis can be settled and he is often treated with an expensive drug without proved necessity

The complexity and uncertainty is due to local treatment of the sore with antiseptics

(2) In cases where hospitals are not immediately available, and in small ships

It is presumed that the dark ground illuminating apparatus will not be available in such cases, and since the indian ink method is undesirable for general purposes, the whole of this method of diagnosis must be omitted and reliance placed upon the Wassermann reaction The patient will thus be in the same position as if he had had a sore treated by blackwash

If the period of time since infection is under four weeks local antiseptics may be applied for the treatment of the sore, and when four weeks have elapsed since infection the blood may be sent for a Wassermann test Subsequent procedure will coincide with

Suggested Procedure for the Diagnosis of Venereal Sores *complicated by Antiseptic or Antisyphilitic Treatment in Hospitals and Large Shops*

Age of sore	Procedure on first examination	Subsequent procedure	
Less than ten days with no treatment	Dark ground illumination	If positive send patient for treatment If negative apply saline dressings for one week and then repeat test on alternate days for four tests in all. Cease anti syphilitics	If positive send patient for treatment If negative apply antiseptics and wait until long enough have elapsed since infection. Then send for Wassermann as below
Four to six weeks after infection	Dark ground illumination	If positive send patient for treatment If negative apply saline dressings for one week and then repeat test on alternate days for four tests in all. Cease anti syphilitics	If positive send patient for treatment If negative apply antiseptics
	Wassermann test	If positive case may be primary syphilis If negative case may be primary syphilis	Assume primary syphilis and send patient for treatment Repeat every fourteen days until three months have elapsed since infection If now positive send patient for treatment If now negative case not primary syphilis

Suggested Procedure for the Diagnosis of *Infected* Venereal Sores *in Hospitals and Large Shops*

Within ten days of infection	Dark ground illumination	If positive send patient for treatment If negative repeat twice third examination being over fourteen days after infection	If positive send patient for treatment If negative regard as not syphilitic. Apply antiseptics but not antisyphilitics internally
Two to four weeks after infection	Dark ground illumination	If positive send patient for treatment If negative repeat twice on consecutive days	If positive send patient for treatment If negative regard as not syphilitic. Apply antiseptics but not antisyphilitics internally
Four to six weeks after infection	Dark ground illumination	If positive send patient for treatment If negative repeat twice on consecutive days	If positive sent patient for treatment If negative regard as not syphilitic but confirm by Wassermann test. Apply antiseptics but not anti syphilitics internally
	Wassermann test	If positive case may be primary syphilis If negative case may be primary syphilis	If for any reason dark ground test is not entirely satisfactory assume primary syphilis and send patient for treatment. Otherwise do not send for treatment as primary syphilis If dark ground test is negative and sore does not heal repeat six and eight weeks after infection If now positive send patient for treatment If now negative case not primary syphilis

[illegible] which the [illegible]

[illegible] when the [illegible] at once [illegible] be applied [illegible] is that [illegible] to hospitals [illegible] on the other hand [illegible] be carried [illegible] infection

[illegible] procedure contained [illegible] They are not of [illegible] and will require to be modified as [illegible]

THE TREATMENT OF NEURASTHENIA BY HYPNOTISM

By [illegible] ROBERT M RIGGALL, R N (Reserve)

[illegible] opportunities of treating cases of neuras[illegible] [illegible] and suggestion and my results have been [illegible] enough to warrant a report of these cases with a description of the methods employed

In this country hypnotism has been so little used as a therapeutic agent that it has not had the success it deserves Now, however, medical men are beginning to recognize its value, and we have our hypnotic specialists, whereas a few years ago such specialists were almost regarded as verging on quackery

It is not easy to do justice to such a wide subject in the limited space at my disposal and my difficulties are increased by the conflicting opinions existing as to the real nature of the so-called hypnotic state Possibly a few points which I shall endeavour to bring forward may help those who wish to try suggestive treatment in their practice

Since the outbreak of War most of us in the Service have seen deplorable cases of neurasthenia following the state of high tension in which officers and men are now living, as well as those cases directly following a naval action or disaster I feel convinced that if suggestive treatment was more widely employed in these cases, many days on the sick list would be saved and fewer invalidings would take place Many medical men are reluctant to try this method of treatment, thinking that they may not be in possession of the necessary personality It follows of course that a strong personality is a great help, but it is easy for the average individual to induce the desired state of increased suggestibility In these cases of neurasthenia deep hypnosis is not required, nor is it desirable, and the best results have been obtained during a light state of hypnosis, in which the patient was fully conscious

Healthy strong-minded individuals are more easily influenced than are the hysterical this fact should be remembered when dealing with neurasthenics or else one may be discouraged It is difficult to persuade this class of patient to concentrate his mind, and much patience and perseverance is required Most of my cases responded after repeated attempts, although a few were complete failures Mental patients, and more particularly idiots,

are much more difficult to hypnotize than are the healthy. My early experience is based on these cases, and when holding the post of Assistant Medical Officer in the Devon County Asylum some nine years ago, I had many opportunities of experimenting on mentally unsound patients. The best results were obtained in cases of recurrent mania in which there were perfectly lucid intervals.

Braid believed that the condition known as hypnosis was one of mental concentration, the mind occupied with a single idea, being indifferent to others. This condition he believed to be due to a physiological and psychological inhibition, the action of certain nerve centres being suspended by the monotonous stimulation of others, the voluntary association of ideas being interrupted.

There are many different explanations of the hypnotic state, but the most reasonable, and I think the most generally accepted, one in present times is that of Frederic Myers, who suggested that there are two distinct states of consciousness. Subliminal consciousness, and the ordinary waking state, or "supraliminal." Myers believed that in the subliminal state the subject exhibited a wider range of physiological and psychical activity. We know, of course, that in the subliminal or hypnotic state a remarkable control over the nervous and circulatory systems is exhibited. Myers believed that works of genius were due to this secondary consciousness. The hypnotized subject exhibits secondary consciousness, and it is possible to demonstrate that the two states of secondary and primary consciousness exist at one and the same time and alternate. In ordinary life this subliminal state is shown by many commonplace facts. For instance, the act of suddenly remembering a name when we have given up trying to find it, waking up from sleep at a previously determined hour, or sudden inspirations of genius such as shown in the composition of a piece of music. Other instances in ordinary life occur such as the complicated act of playing the piano when the attention is otherwise employed; cases of dual personality also come under this category.

The subconscious mind is a strange thing and plays curious pranks with our health and thoughts. Drugs and other therapeutic agents have no marked influence on it; psychical influence is our only method of reaching it, and through the channel of hypnotism these influences are most easily employed. A great number of people suffer from some form of obsession, and in certain unstable minds an obsession may take a painful and serious form, and more especially so if it be of a sexual nature. It is in such cases

that suggestive treatment will prove to be a great success. Those who are interested in this most engrossing and intricate subject should read Freud's book on "Psycho-analysis." In this short paper I cannot dwell upon the subject as my aim is to show what can be done for the many cases of neurasthenia which are a direct result of the present War.

Most of my cases were treated during their sojourn in the Welcome Royal Naval Hospital, Chatham. I propose to describe in detail two of the most interesting of these, but before doing so I will quote Liébault's classification of hypnotic sleep in the hope that it may be of use to the uninitiated.

Liébault's Classification.

First Degree.—The patient feels a heaviness of the eyelids and a general drowsiness.

Second Degree.—This is characterized by suggestive catalepsy. When the operator places the arm in a certain position and says it is to remain there, it is impossible for the patient to put it down. It remains rigid and fixed for a much longer time than would be possible in a natural state. In these two degrees consciousness remains almost complete and often the patient denies having been in the hypnotic state because he has heard and remembers every word which has been spoken to him. A large proportion of people never pass beyond this stage.

Third Degree.—In this the subject is also conscious of everything going on around him to a certain extent and hears every word addressed to him, but he is oppressed by great sleepiness. An action communicated to a limb is automatically continued. If the arm is rotated to begin with it goes on turning until the operator directs its stoppage. The term "hypotaxis" is applied to these second and third degrees.

Fourth Degree.—In the fourth degree of hypnotic sleep the patient ceases to be in relation with the outer world. He hears only what is said to him by the operator.

The *fifth* and *sixth degrees* according to Liébault constitute somnambulism. In the former recollection of what occurred during sleep is indistinct and recalled with difficulty; in the latter, the patient is unable to recall *spontaneously* anything which has occurred while asleep. All the phenomena of post-hypnotic suggestion can be induced in this condition, and it presents features of extraordinary interest to the psychologist.

[illegible] admitted March 3 1916 discharged April [illegible] 1916

The wounding was [illegible] H.M.S. T.B. 11 blown up by a mine off Harwich. He [illegible] had been nervous looking lad. He stated that a week after [illegible] he began to dream. His dreams always took the same form [illegible] of an explosion being repeated and he would wake up [illegible] his imperial shipmates ringing in his ears. He was therefore [illegible] the rest of the night.

On examination there [illegible] were found. All the superficial and deep reflexes were normal except that the knee and ankle jerks were somewhat increased. Upon engaging him in conversation he discussed his symptoms in a rational manner and showed no signs of being mentally unsound. The night sister reported that he was restless and slept badly. Large doses of potassium bromide and paraldehyde were given after which he slept better. He was dogmatic in his assertions however that these drugs had no effect on his bad dreams. On April 14, after nearly three weeks in hospital his condition showed no improvement and he was persistent in his statements regarding the bad dreams which he stated had occurred every night without intermission.

On April 15 I hypnotized him and he subsequently proved amenable to treatment. At the first sitting he readily responded and the deepest stage of hypnosis was rapidly induced. The method I employed was as follows. The patient was told to lie back in an armchair making himself comfortable and allowing his muscles to relax. He was then told to keep his eyes fixed on an ordinary clock which was at the same time centralizing his attention on the light. The suggestion of sleep was then made and the patient was repeatedly told in a monotonous voice that he was becoming more and more sleepy. Then in an emphatic voice he was told that the treatment would completely cure him.

The outstanding feature in this case is that there were no more dreams after the first sitting. The patient was subsequently hypnotized every alternate day until April 26 when he was discharged to duty quite cured. After the first sitting the monotonous stimulation of the sight centres by means of the electric light was dispensed with and the patient was simply told to go to sleep. He is he would do immediately on entering the room and when standing up. At subsequent sittings he was made to write simple sentences twenty times such as copy book style these were of the following nature — I feel much better. I shall have no more bad dreams. I am cured.

I generally gave a post hypnotic suggestion which was thus noted upon. This suggestion was that at the following morning on the patient would tell me spontaneously that he was better and felt that he would never dream of the disaster again. It should be noted that no soporific drugs were administered from the time of hypnotic treatment was commenced and the patient was discharged to duty. On the occasion after it was necessary for the patient to sit at the bedside and suggest an extract and give him a post hypnotic suggestion to the effect that no pain would be felt during the operation. This suggestion was carried out to the case in spite of the fact that a local anæsthetic was not administered. After the first two or three sittings attacks of hysteria were completely of persisting in spite of his being told that they would not occur. These

headaches were relieved by the following method The blunt end of a lead pencil was lightly pressed on the patient's forehead at the same time it being suggested that the pencil was hot and would burn also that upon the patient waking up it would cause him a slight itching pain for half an hour at the end of which time the headache would be relieved This proved to be the case and the patient never afterwards complained of headaches An interesting feature connected with this incident is that a distinct erythema of the skin was observed over the point of pressure It is known that vasomotor dilatation and even actual blistering can be produced by suggestion

It was stated in an earlier remark that the first two stages of light hypnosis are the best for suggestion This case proved to be an exception as the deepest stage of hypnosis was induced from the commencement

Case 2—A seaman, R N R, aged 31 Admitted May 5, 1916 discharged May 16 1916 This rating was admitted from Avonmouth with symptoms of neurasthenia He complained of weakness and loss of sensation in his arms and legs He sleeps and eats well The symptoms commenced in Alexandria about two months previously, and had been getting steadily worse since The patient gave no history of having been in action or of having had anything in the nature of a nervous shock

On examination he was a fairly well nourished man, slightly below the average height His features were heavy and dull, and he exhibited rather less than the average amount of intelligence Examination of the circulatory, respiratory gastro intestinal, and genito urinary systems revealed nothing abnormal

Nervous System—Knee jerks much increased Plantar reflex showed a faint flexor response No ankle clonus; ankle jerks increased All other reflexes normal The pupils reacted well to light and accommodation and there was no nystagmus The discs and visual fields were normal The gait was normal and there was no romberg sign Anæsthesia was complete in both legs from the soles of the feet to a hand's breadth above the knee joints There was no sensation to heat and cold and the patient was unable to feel the application of test tubes containing ice and boiling water respectively or distinguish any difference between them Exactly the same condition was present in the arms the anæsthesia being complete from the tips of the fingers to the shoulder joints There was no loss of sensation in any other part of the body A fine tremor in both hands was continually present On the morning of May 8, as the symptoms had not varied it was decided to employ treatment by suggestion The patient proved to be a difficult subject to hypnotize as his power of concentration was not good, but at the first sitting the first two stages of hypnosis were induced, and the patient was told that the tremors of the hands would cease and never return this proved to be the case On the following day the same light degree of hypnosis was induced, and the patient was again repeatedly told that all his symptoms would vanish and that he would feel perfectly well on the next day never to have a return of his trouble This proved to be the case and examination on May 11 revealed nothing abnormal After a few days observation the patient was discharged to duty cured

The symptoms in this case were purely hysterical and therefore proved amenable to suggestive treatment

AN OUTBREAK OF BERI-BERI IN THE EMPRESS OF ASIA

By Staff Surgeon PERCY B EGAN MD BA RN

During the period from August 5 to December 31, 1914, thirty-eight cases of beri-beri occurred on board five of which terminated fatally More than half of the ship's company were Chinese engine room ratings, and amongst these latter thirty-four of the cases appeared three cases only were amongst the Chinese seamen and the remaining case was in a European an engineer officer whose case presented several difficulties both from the points of view of cause and diagnosis and will be referred to at length later

I was informed by my colleague, Temporary Surgeon S E Abbott, who was in medical charge of the ship prior to her being taken over by the Admiralty, that when the ship was on her usual trans Pacific run, he always had a certain number of cases of beri-beri The number of cases during this five months was much above the average and it is difficult to understand why, as the diet of the native crew in no way varied, and the working conditions were very similar to those prevailing before the outbreak of war, except for the fact that during the run across the Pacific the climate changes a good deal, which may or may not have some bearing on the increased incidence of the disease. It is of interest that during the month of December, when the ship was using Aden as a base only three fresh cases, two being very mild occurred, and at this time the morning and evening temperatures were comparatively low in contradistinction to the sustained heat encountered in the Indian Ocean and China Sea

Incidence of the Disease—(*a*) Europeans one engineer officer (*b*) Chinese thirty four firemen and three seamen

It will be noted that the distribution was somewhat peculiar only one European contracting the disease and of the Chinese only three upper deck hands while none of the steward's department were affected—indeed, until the last few days of the year not a single case occurred amongst these two classes

As regards the firemen the following facts may be of some interest as regards the type of men who suffered When the ship was fitting out at Hong Kong early in August a large number of the Chinese ratings went ashore, and did not return, probably not caring to incur the risks of war, and when the ship was ready for

on new duties great difficulty was experienced in getting other the old hands to return or new ones to volunteer in their places However with the assistance of the shore authorities a sufficient supply of native ratings was at length forthcoming but a large number of these were young and quite inexperienced coming direct to the ship from shore life, nor were they of very robust physique More than half of the cases of beri beri that I had to deal with occurred amongst these men who nearly all came from the Canton district and, previous to joining the ship had been engaged in farming or other shore-going occupations

Diet —All the Chinese on board—seamen, firemen and stewards boys—were fed mainly on rice but they also had a good supply of fresh meat each day and a sufficiency of fresh vegetables The rice used was chiefly Hong Kong rice of the best quality, and highly polished, exactly the same as they had been getting from the Canadian Pacific Railway Company On September 3, the ship being then at Singapore a fresh supply of rice was obtained and issued, it seemed to be of much the same quality as that purchased in Hong Kong, and, like it, was polished some days after it had been issued three fresh cases of beri beri presented themselves for treatment following a period of about a fortnight when the ship was free from the disease I only mention this as a coincidence in passing as I do not think the Singapore rice after such a short interval can be looked on as a factor in producing this recrudescence of the disease Shortly after this I recommended the purchase of some unpolished rice, and this being done several efforts were made to induce the firemen to eat it but they had become so accustomed to the polished rice that they emphatically refused to try it and apparently preferred to go hungry rather than eat it though it was pointed out to them many times that it was not issued with any idea of economy but for their benefit, but the Chinaman is very obstinate, and all our efforts were unsuccessful so was a suggestion that for a time they should cease to use rice altogether, and try a diet on European lines Considering this attitude of our firemen and taking note of the fact that to a large extent the fighting efficiency of the ship depended on their carrying out their duties well and cheerfully it was felt necessary to fall in with their wishes and again to issue the much desired polished rice the remaining stock of polished Singapore rice was issued to the seamen and stewards boys with no ill consequences as no cases of beri beri occurred in either of these classes until long after the supply was exhausted

No further change was made until the latter part of November, the ship again being at Singapore when acting on a suggestion of Dr Castellani, of Colombo I advised the purchase of a supply of Calcutta rice this rice though unpolished, is of a very good quality and is fairly white We experienced no difficulties when it was issued as it apparently satisfied the fastidious taste of our firemen I consider it is a most interesting fact that the issue coincided in a remarkable way with the cessation of beri beri amongst the firemen the only three cases of the disease in the month of December were seamen As to diet, one additional fact may be mentioned As I have stated, most of the cases occurred after the ship had been to Singapore and Colombo and while she was using the last named port as a base, and the idea prevailed among the crew that the disease was due to Colombo water drunk in large quantities by men accustomed to working in the stokeholds and engine rooms

CONSIDERATION OF THE CASES

It was noticed that two distinct types of cases were met with presenting the following signs and symptoms

(1) *The Wilder Type*—Here the patients first came to the sick bay with a history of weakness of the legs of two or three days duration and as a general rule they did not complain of any definite pain the gait was of a very constant type slow uncertain and swaying with complete inability to increase the speed patient staggering and falling on attempting to do so slight oedema of the feet was present in most cases and where this was not so the patient generally gave a history of swelling of the feet two or three days previously No oedema was present in other situations and the general appearance of the patients was normal—heart lungs and other organs normal The knee reflexes were in all cases abolished and in this connection I would mention that Dr Castellani pointed out to me that increased knee jerks was a not infrequent early sign but in none of my cases was this evident All these soldier cases, of which there were thirty one under treatment progressed favourably and in none did cardiac symptoms develop They were all with two exceptions discharged to hospital where they did very well—eleven cases returning to the ship and all quite free from all traces of the disease and three being discharged from hospital to their homes

(2) *The Cardiac Type*—In this type the symptoms and signs were rather different and much more serious usually the complaint

was made [illegible] if the patient did mention it it was only [illegible] spontaneously. The chief symptom that caused them to [illegible] treatment was pain in the chest, and that this had been present at some time was evidenced by the severe patches of burning in the pectoral regions showing that before seeking medical advice they had recourse to the Chinese method of counter-irritation by pricking the skin and subcutaneous tissues over the [illegible] pain. The breathing was somewhat laboured and the [illegible] of dilatation the area of cardiac dulness being [illegible] the pulse was irregular pulse rapid cardiac sounds [illegible] and the rhythm of the heart of a peculiar cantering character. It was noted that in several of these cases there was a slight degree of oedema of the subcutaneous tissues of the face, giving the patients a rather puffy or bloated appearance. Seven cases were of this cardiac type and of these four died the duration of the illness from the time they were first seen being under three days in all but one of these fatal cases. The other two cases were discharged to hospital and as far as I can learn have done well.

From the above facts it will be seen that the cases which developed cardiac symptoms most of which went on to a fatal termination, developed these symptoms early and there were no instances of the milder type later on developing cardiac symptoms.

Points of Interest in Some of the Cases.

(1) *Fever.*—In two cases fever was present at the commencement of the illness. Case 31 Chinese fireman aged 22. This man when first seen had a temperature of 101 F. pulse rate 90 slight catarrh. Next day his temperature was normal and heart slower the symptoms of beri-beri presented none of the usual mild type and while under treatment on board there was nothing further of interest in his case. On November 23 he was discharged to the General Hospital Singapore.

In the other case, which terminated fatally fever was a more prominent feature. Case 61 Chinese A.B. aged 19. This the first in which an upper deck rating was found to have beri-beri occurred after the ship had been a period of about three weeks had been free from the disease. When first seen he complained only of cough which troubled him greatly at night. Temperature 101.6° F. pulse 91. On examination breath sounds rather roughened but nothing very definite heart sounds normal no peripheral oedema and no complaint of weakness knee jerks present and normal. It seemed to be a case of some slight bronchial inflammation and there was nothing to indicate a dangerous of beri-beri. The ordinary remedies for such a condition were prescribed and patient was kept in bed on light diet for a week his temperature did not materially alter the temperature ranging from 99° F. to 101 F. and though repeated examinations of his chest were made and nothing more definite dis-

[illegible] sketch of [illegible] and could [illegible] days and [illegible] ber 29.

[illegible] of interest for [illegible] —

[illegible] had [illegible] first upper deck [illegible] the ship [illegible]

[illegible]

[illegible] October [illegible]

The second [illegible]

engineer aged 48 October 19, at Colombo His case presented several difficulties He first came under treatment for a crop of boils on the head neck and hands, was looking low and run down and apparently he felt the extreme heat very much After he had been some time under treatment attending daily but still carrying out his duties as senior engineer of the ship his gait was noticed to be unsteady and staggering in character but was not typical of beri beri as evidenced in the other cases There was no trace of œdema of the feet or elsewhere Beri beri was at once thought of as a possible diagnosis, the absence of knee jerks and the loss of power in the legs pointing in that direction other causes of multiple neuritis were wanting there was no question of drugs as a cause, though the pupils were "pin point" and markedly sluggish Alcohol could likewise be dismissed from consideration as he had for years been practically a total abstainer There was no pain or muscular tenderness in the legs the only sensory symptoms being slight tingling of the soles of the feet I was strongly inclined to make a diagnosis of locomotor ataxia and in favour of this there was an Argyll Robertson pupil though the very contracted state of the pupils made this rather difficult to elicit also Romberg's sign was well marked but I found this sign also in several undoubted cases of beri beri Against the diagnosis of tabes was the gait which was by no means typical of that condition there was no history of lightning pains and he denied venereal infection

The patient was eventually discharged to the Victoria Nursing Home at Colombo a provisional diagnosis of tabes being made but after being under treatment ashore for some time the medical man in whose charge he had been placed decided in favour of the original diagnosis, beri beri, being chiefly inclined thereto by the very marked improvement in his condition which occurred under the influence of complete rest I saw the officer again six weeks later which time he had spent in hospital and convalescing on the hills but unfortunately I had no opportunity to examine him his general condition had very much improved but his gait was still far from normal and seemed to me to approximate more closely to that usually found in beri beri than which he was first under treatment he did not rejoin the ship and was at length invalided home I have since been informed he has now quite recovered and is serving afloat

Treatment—The treatment carried out in all cases was of course only palliative in character and I cannot say that it produced any very marked effect on the course of the disease In all cases a saline purge was given at the onset and this was repeated at intervals as necessary the bowels being made to act freely this combined with rest sufficed to very quickly reduce the œdema when present Salicylates were also given and seemed to produce some slight improvement and freedom from pains Other drugs, iron &c were tried in several cases but with no success In all cardiac cases I gave a mixture of digitalis and strychnine, but here again the results were not encouraging, and in the later stages of these cases

[illegible] were administered hypodermically [illegible] with [illegible] more than relieving the greatest [illegible] distress [illegible] nutrition of the heart. As mentioned earlier [illegible] the types of beri-beri met with [illegible] cases went [illegible] nutrition in these cases drugs appeared to have not the slightest effect in checking the progress of the disease.

Diet of the [illegible].—Rice was eliminated as far as possible from the diet [illegible] was not found possible to rigidly exclude it. A diet of [illegible] varied character than usual was substituted consisting [illegible] fresh vegetables with some meat.

Isolation of the [illegible].—After the first cases of beri-beri it was considered advisable to isolate any others that might occur and with this object in view a large and well ventilated room was set apart for use as a hospital, where all the remaining cases were treated. In this connection I might remark that all the cases occurred in batches of two, three or four, and it was noted that in a few at least of these batches the patients had been sleeping in close proximity to one another.

While the ship was at Colombo I had the great advantage of being able to consult Dr. Aldo Castellani (now Professor of Tropical Medicine at the University of Naples) who very kindly came on board the ship and inspected the arrangements which had been made for dealing with the cases and gave me some valuable suggestions as to diet and treatment. I would also like to mention the able co-operation of Dr. S. F. Abbott, Temporary Surgeon, R.N., who had had considerable experience of beri-beri while in medical charge of the ship, before she was taken over by the Admiralty.

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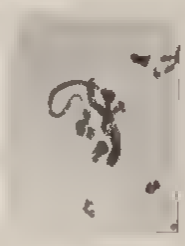
MIXED [illegible] INFECTIONS IN CASES FROM WEST AFRICA

[illegible] W. EWETT SMITH [illegible] MRCS [illegible]

[illegible] from West [illegible] occurrence [illegible] organisms in the [illegible] often [illegible] mixed [illegible] extent [illegible]

[illegible]



[illegible]

[illegible] was seen with [illegible] Malaria [illegible] both [illegible] malignant types of [illegible] associated with trypanosomiasis [illegible] malignant malaria with *Filaria perstans* [illegible] malignant malaria with *Filaria volvulus* and Gilbert [illegible] *Filaria* [illegible]

[illegible] malignant malaria with Gilbert's swelling [illegible] all these cases the most striking feature noted [illegible] has been the huge degree of

[illegible] eosinophilia found. This has been seen [illegible] any evidence of Calabar swellings though [illegible] the degree of eosinophilia is nearly always [illegible] following blood counts showed how marked this may be.

Case of mixed quartan and malignant tertian [illegible] Calabar swellings and presence of *F. perstans*. A. A. Pte. [illegible] returned from Cameroons July, 1915; hospital August, 1916.

	Poly.	Mon.	Lymph.	Eos.	Tra.
	Neut.	Perc.	Large.	Perc.	Large.
Aug. 3	38	2	22	35	8
Sept. 1	41	1	17	50	1
Oct. 1	40	2	20	46	4
Nov. 1	32	2	23	41	2
Dec. 1	34	3	24	35	4
Dec. 18	35	2	18	40	5
Jan. 1	35	1	22	39	3

Many intermediate counts were made.

As Calabar swellings were present many times [illegible] both night and day but never could [illegible]

By taking 1 c.c. of blood into citrated saline [illegible] making thick films and debaemoglobinizing [illegible] *F. perstans* was found; the parasites only [illegible] infection may be missed. In a second case [illegible] since [illegible] R.M.L. disease contracted [illegible] 1915; hospital August, 1916.

Relative blood counts.

	Poly.	Mono.	Lymph.	Eos.	[illegible]
	Neut.	Perc.	Large.	Perc.	Large.
Aug. 3	40	1	22	33	—
[illegible]					
21	17	2	21	33	[illegible]
Sept. 3	1	2	16	31	[illegible]
24	11	2	12	38	1

In a third with still marked Calabar [illegible] examined only once but no third [illegible]

The cause of Calabar swellings [illegible] transmitted chiefly with *F. loa* and it [illegible] these cases [illegible] would expect the [illegible] if present. But [illegible] small *F. perstans* was found [illegible] swellings, there this fact [illegible]

The natural cause of the eosinophilia [illegible] certainly was not due to contained [illegible]

frequently examined for ova and none were ever detected Was it due to the possibly latent *Filaria loa* and *diurna* infection or was it due to the demonstrated *Filaria perstans*? Another point which was very noticeable was the persistency of the quartan parasite in spite of prolonged treatment with quinine and in the case of the trypanosome infection the occasional appearance of the quartan parasite after the patient had been for months regularly treated with atoxyl and intravenous injections of arsenic oxide and antimony If under these conditions the parasite can maintain its existence in the body, it is not remarkable that outbursts of latent quartan malaria should be found at long intervals in more or less untreated cases I have to thank Mr S Mangham M.A, for making many of the blood counts and also for the photographic reproductions of the filaria

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HYPERTHYROIDISM AS OCCURRING IN SAVAGES

[illegible] SECOND LINDSAY MEDAL

At the [illegible] light has recently been thrown [illegible] of the [illegible] ducting or endocrine glands [illegible] work still [illegible] be done before any fill[illegible] given of the [illegible] relationship either to normal [illegible] metabolism.

From the [illegible] viewpoint, attention has [illegible] focussed on what [illegible] be termed the gross disorders [illegible] crine glands — those characterized by such well marked [illegible] symptoms and associated with such definite pathological lesions in one or other of the glands that they cannot fail to strike the observer.

On the other hand, it has long been recognized that the endocrine organs play a part in the normal metabolism which, though subtle is yet of paramount importance. Even in classical times the relationship of the thyroid gland to fertility in the female appears to have been recognized while both ancient and mediæval literature abound with references to the connection of the emotions with the liver. These references are all the more interesting since in a recent work Crile [1] attempts to trace the cause of certain of the emotions to the secretions of the liver, adrenal and thyroid glands, believing that together with the brain these organs form a kinetic system governing more particularly rage and fear.

It is certainly rather more than a mere coincidence that the appearance of a patient with Graves's disease is closely similar to that of a person suffering from the extreme of terror. The staring eyes, the rapid pulse, the flushed skin, the trembling hands are no less the signs of Graves's disease than of that violent emotion known as fear.

The part played by intense emotion in the production of exophthalmic goitre has long been recognized. In war, the emotions of fear and rage have free play, and as Crile has shown in his experiments on dogs and rabbits, the expression of these emotions is accompanied by an increased secretion of the adrenal and thyroid glands.

The question therefore naturally arises as to the effects of war in the production of lesions of the endocrine organs. The condition known as "soldier's heart" has been regarded as due to a hyper-

thromboses [illegible] Parkinson [illegible] who showed [illegible] diagnosis of hyperthyroidism.

In the present type [illegible] not seen [illegible] as having occurred [illegible] during the present War.

A [illegible] of the following cases may prove of interest, [illegible] attention to [illegible] which undoubtedly is [illegible]

[illegible]—S. B., aged 36. A.B.R.H. This patient had left the [illegible] years before the beginning [illegible] having been invalided [illegible] an attack of dysentery [illegible] West coast of Africa. [illegible] he drove a large [illegible] London as occupa[illegible] requires considerable [illegible] During this [illegible] untroubled by any illness [illegible] last eight months of [illegible] on the Atlantic [illegible] in perfect health. It [illegible] he had lost in the last six for some months [illegible] that he began to feel [illegible] and irritable. He did not [illegible] until February [illegible] he had left the [illegible] he complained [illegible] headache chiefly frontal [illegible] of a dull character. He [illegible] this headache [illegible]

[illegible] he noticed [illegible] the following symptoms [illegible] admission to hospital [illegible]

He [illegible] to be of an irritable [illegible] disposition and could [illegible] for any length of time. A [illegible] he complained of sleeplessness and [illegible] Three days [illegible] to hospital he developed [illegible] a scarlatiniform rash on [illegible] legs. This was followed [illegible] later by desquamation. [illegible] at first thought that the patient was [illegible] scarlet [illegible] the clinical absence of sore throat [illegible] contradicted this diagnosis. In addition, about the [illegible] rash [illegible] disappeared.

[illegible] noticed however that the patient's pulse was [illegible] and tender on pressure. [illegible] examination [illegible] symptoms of hyperthyroidism [illegible] appeared.

[illegible] marked tremor in the hands and tongue [illegible] the patient [illegible] questioned closely he became [illegible] in profuse sweat. The [illegible] also were very [illegible] The patient complained [illegible] attacks of palpitation [illegible] and shortness of breath on the slightest exertion. Occasionally he became very [illegible]

On examination the heart was found [illegible] although no [illegible] was present. The radial pulse was [illegible] usually [illegible] 100 per minute and over [illegible] The [illegible] was [illegible] the heart [illegible] both in [illegible]

The eye symptoms were [illegible] exophthalmos [illegible] was conspicuous by its absence. The [illegible] was never present and there was no [illegible]

There were thus present three of the classical signs of hyperthyroidism

[illegible] enlargement [illegible] thyroid gland [illegible] hands and tachycardia [illegible] to other cardiac [illegible]

The deep reflexes [illegible] greatly increased [illegible] there was no actual change in [illegible] condition [illegible] the phenomena such as tremor and [illegible] were noted.

Tache cerebral [illegible] distinct but [illegible] flushing of the face was very frequent.

The temperature [illegible] normal throughout the time that the patient was under observation.

Excessive sweating [illegible] was no upper limit to [illegible] possible for the condition as the patient [illegible] consumed [illegible] 1 oz. of tobacco a week.

Case 2.—W. S. [illegible] joined the R.N.R. [illegible] the Army but left [illegible] involuntarily [illegible] malaria contracted [illegible] Canada but [illegible] the outbreak of War [illegible] joined the R.N.R.

For the first seven months [illegible] mine sweeping [illegible] Straits of Dover and then [illegible] the Mediterranean [illegible] on patrol duty.

Incidentally [illegible] of escapes [illegible] Sollum and during the [illegible] he was not however until [illegible] although he stated [illegible] past.

His chief complaint [illegible] cardiac region [illegible] also noted that [illegible] from the neck. On examination [illegible] the thyroid gland [illegible] were somewhat [illegible] was under observation [illegible] though here [illegible] was diffused [illegible] if [illegible] per minute [illegible]

There was [illegible] constantly sweating profusely [illegible] place. Nervous [illegible] features of the [illegible] more particularly [illegible] all increased in activity.

Case 3.—T. S. [illegible] the Navy before the War [illegible] in a Yorkshire colliery [illegible] nervous disposition [illegible] until he had been on the [illegible] At this time he was [illegible] under shell fire [illegible]

He first noticed that [illegible] and could not sleep [illegible] troubled by dreams of [illegible] a slight catching in the throat [illegible]

that there was a noticeable lump over the thyroid gland which was pulsatile and somewhat tender A bruit de diable could be clearly heard on auscultation

In the cardio vascular system, pain palpitation and shortness of breath were all well marked symptoms There were no cardiomegaly but the sounds were distinctly tic-tac in character perhaps owing to some myocardial change Of eye symptoms there were none The pulse varied from 100 to 130 per minute and was of a characteristically low tension, combined with some irregularity both in rhythm and amplitude

There was distinct tremor of the hands and tongue and considerable increase in all the deep reflexes

The patient also complained of a feeling of numbness in the legs although on examination there was no impairment of cutaneous sensation Attacks of acute gastritis were of common occurrence and during the last few months there had been a considerable loss of weight The urine in this instance contained a very slight trace of albumin The patient smoked about 2 oz of ship's tobacco a week

Case 4—F L aged 26, leading stoker This rating had been in the service for eight years His family history was of a somewhat neurotic type three suicides having taken place among his near relatives in the last few years

He took part in most of the bombardments off the Belgian coast and on one occasion was struck on the back of the head by a small fragment of shell The wound however, was of a superficial character only

In March 1916 patient was sent out to the East Indies Station and shortly afterwards began to suffer from the symptoms of hyperthyroidism At this time he was much worried by family affairs, as his wife was expecting her first confinement

The symptoms were very much the same as those detailed in the other cases and consisted of extreme nervousness insomnia, and tremor of the hands The thyroid was enlarged tender and easily palpable The heart was normal but the pulse as before was rapid and irregular Vertigo was a marked feature in this case while both the superficial and deep reflexes were exaggerated The urine was normal

Of the many contributions of experimental physiology to medicine, none has been more important than the application of thyroid extract in the treatment of cretinism and myxoedema In addition, thyroid extract provides an extremely delicate test for the detection of cases of hyperthyroidism, since patients suffering from this condition react in a remarkable manner to the exhibition of the drug

In all the above cases 5 gr of thyroid extract were administered thrice daily for three days, a similar amount being given to four other patients in order to serve as a control The results were extremely interesting as in the four cases suspected of suffering from hyperthyroidism there was a marked exacerbation of all the symptoms The tremor of the hands and tongue became more

[illegible]

[illegible]

In regard to [illegible] it is noticeable that all the patients had been [illegible] less continuous strain a condition approximating to that in the trenches. It will be interesting to see [illegible] but it is possible to [illegible] of a modern naval battle.

With [illegible] men were in middle life.

Except [illegible] of any kind [illegible] specially [illegible] fact which is [illegible] considerable interest [illegible] that experimentally [illegible] tension of the cervical [illegible] raised by feeding with thyroid extract [illegible] the cervical sympathetic easily causes it [illegible].

Although [illegible] first demonstrated that the [illegible] to a hypersecretion [illegible] still remains [illegible] activity.

In this [illegible] of special interest [illegible] believed to be [illegible] to be governed by [illegible] cortex [illegible] of a psychological [illegible] breakdown [illegible] the same result may [illegible] one of the [illegible] as a lesion of [illegible].

(1) Cann [illegible] Sanders [illegible]

(2) Stewart [illegible] Apr. [illegible]

(3) Parkinson [illegible] July [illegible]

A NAVAL MEDICAL OFFICER'S IMPRESSIONS OF A VISIT TO THE TRENCHES

By Fleet Surgeon C. Marsh Bladnell, R.N.

(*Continued from p. 107.*)

A cheerful, more optimistic, more healthy looking set of men than those with whom I had the honour of sharing [illegible] could be hard to find. Discipline of course was strict, but [illegible] recognized the necessity of this and thoroughly understood [illegible] own welfare depended on its maintenance. As one of them put it [illegible] "One cannot afford to play the fool when one is within half a [illegible] of the most highly organized and unscrupulous army on the [illegible]." Serious crimes were very exceptional but when men had [illegible] they were little fishes.

The discipline among the Colonial regiments was not perhaps what [illegible] strict, but than the average Colonial like the average [illegible] regarded these things in the same light as the Regular [illegible] soldier and sailor who have been accustomed to discipline from [illegible]. The experiment of mixing Colonials with Regulars [illegible] in the concentrement of the war and was abandoned [illegible]. The Colonial is too democratic and yet too clannish to be [illegible] his fashion and soldier and officer must work together [illegible] one mother which is not the case if the one is any [illegible] the other of an Australian regiment. Keep them [illegible] and everything works smoothly and they prove them[illegible] everyone out there realizes—in fact among the most valuable [illegible] possessions. Indeed I may would add that in some respects [illegible] scouting patrol work they come second to none. I can [illegible] two illustrate the respective viewpoints of the question if [illegible] a couple of incidents, one of which is a story told [illegible] Birdwood against his staff. The General who I should say, [illegible] looking very much younger than he was walking with one [illegible] officers through some positions held by the Australians. They [illegible] another man who neither saluted stood to attention, nor in [illegible] any notice. The General did not appear to mind in the least [illegible] not mind and more angry, and at last could stand it [illegible] to one of the men who had his hands in his [illegible] hit well on the back of his head and said [illegible] "Old man, why don't you salute your officers when they [illegible] don't you know your own General—General Birdwood [illegible] very astonished and then replied [illegible] "That the General?" [illegible] pause after which he added "Thou why don't he [illegible] like any other old bird would!" The other [illegible] occurred in the American Filipino war at a time when I had [illegible] privilege of assisting the American surgeons at the front. [illegible] those [illegible] used to wear the American uniform, but without any distinctive [illegible] denoting rank or other. Provided by General Otis with a pass to

[illegible] anywhere [illegible]
[illegible] outskirts [illegible]
[illegible] tenny. He had [illegible]
[illegible] he sat on a very [illegible]
[illegible] sorry would have [illegible]
[illegible] to his pass. This [illegible]
[illegible] nearer he, never [illegible]
[illegible] have we got a [illegible]
[illegible] any tobacco [illegible] reply [illegible]

"Well, have you [illegible] No? [illegible]
have you got—[illegible]
[illegible] by trenches. W[illegible]
[illegible] appointed to find [illegible]
[illegible] trousers. The [illegible]
[illegible] many hat he smil[illegible]
[illegible] And so on. [illegible]
[illegible] out in those trenches [illegible]
[illegible] the medical [illegible]
[illegible] has [illegible]

It was extraordinary [illegible]
such as puttin[illegible] this and [illegible]
figured as [illegible] cans [illegible]
filled with sand they help[illegible]
The latter functioned [illegible]
trousers [illegible] crop [illegible]
[illegible] detonally in the trench [illegible]
[illegible] system of [illegible]
[illegible] another, but this [illegible]
I was [illegible] to [illegible]
call Pinat[illegible]
on that shell [illegible]
case the explosion [illegible]
exploited [illegible] though some [illegible]
detonator. By a [illegible]
original [illegible]
this is often [illegible]
a man sun[illegible]
the war [illegible]
which he would [illegible]
charge [illegible] Hot [illegible]
bits long ago is still [illegible] But [illegible]
individual [illegible]
had been in London [illegible]
been known [illegible]
and the other [illegible]
He has been [illegible]
opportunities for [illegible]
manifestly [illegible]
one will gathe[illegible]
war his method[illegible]
the extreme. On one occasion [illegible]
in our trench. S picked [illegible] ding Oh [illegible]

was at the time having his dinner and the other officers "Look, sir, what a just dropped," he said. He was peremptorily ordered to remove himself and the shell, and to throw the latter into a pool behind the rear parapet. After dinner the Commanding Officer, not feeling quite happy, went in search of S. and discovered him trying to prise open the "lid" of the canister. The delinquent was there and then made to throw the missile into the depths of the pond. But the matter did not end here for in the small hours of the morning our hero was wading to and fro through the pond until he stumbled up against the "dud" which he carried triumphantly to his "dugout" successfully removed the explosive and next day was offering the empty case to the relic collectors for half a crown. That familiarity undoubtedly breeds contempt was vividly illustrated on another occasion by the sight of Private S. driving a 3-inch French nail into the support of his parapet by means of a hand grenade! He was severely punished for this, but that he took the ups and downs of life with philosophic composure was shown by his behaviour during the last gas attack. At fifty yard intervals along the trench is hung a gong in the shape of an empty cartridge cylinder or paraffin tin, and this is struck loudly directly the enemy start their gas offensive, so that everyone in the trench may don his gas helmet and man the parapet to check the infantry attack. During this particular attack a man whose face could not be seen as his whole head was enveloped in a gas helmet was observed beating the gong vehemently with a hand grenade. His fellow occupants of the trench seized hold of the man, took off his helmet and mask and thereby had bare to the foul winds of heaven the unashamed unrepentant and exceedingly irate visage of Private S.

Of course these incidents relate to the earlier phases of the campaign. S. is more experienced now and has more respect for "dud" shell, for as he drily remarked one morning when showing me a German "pippin," "You know sir, all is not dead that's rusty." However, despite this little weakness of his in the shape of shell collecting, Private S. is a very, very conscientious and hard working soldier, well spoken of by his company officer, popular with his regiment, and one and all sincerely hope he will not come to a bad and fragmentary end.

Gas Attacks. Routine in Trenches and Rear Positions to cope with the Gas Offensive. Effects on Man, Animals and Vegetation.

If our foes are somewhat careless and contemptuous to their attitude towards the enemy's shot and shell, this is not the case as regards the comparatively unsportsmanlike use of gas. One seldom sees a man who has not wearing the little satchel that contains the chemically prepared gas helmet. Once gassed—and everyone of the officers and men with whom I have had been—the experience is never forgotten and never forgiven—it is the unforgivable crime of trench warfare. And yet there are men, Englishmen wearing His Majesty's uniform, who have got up in public and dared to say that the Germans had every right to introduce this abominable practice into warfare, that its use is no more inhuman and abominable than is that of high explosives and finally that our soldiers at the Front object to it no more than they do to shot and shell. A few days ago I was asked to record my vote on a ballot paper as to whether or not Germans should be retaliated on the list of Fellows belonging

[illegible]

[illegible] in consequence [illegible] all upwaters and [illegible] so much [illegible] drifting [illegible] into [illegible] flow [illegible] hill meeting [illegible] on the [illegible] Vegetation [illegible] in the year of the frost [illegible] The [illegible] another while the upwaters remain [illegible] passing relapse [illegible] whereas cows [illegible] only the gas clouds them. The pig [illegible] in the cow [illegible] the sow and [illegible] not accustomed to [illegible] lungs like the [illegible] in the cow [illegible] fragile in support [illegible] to the well known fact [illegible] whereas tubercul[illegible] the horse it is very prevalent among cattle [illegible] they instinctively fly upwards to the [illegible] is chickens suffered badly and I was [illegible] the cows quite a gift of this com[illegible] fact that the pheasant [illegible] except at night time when it [illegible] in the early phase of the war in [illegible] the [illegible] Now however they have quite d[illegible] exception of [illegible] are still to be seen or [illegible] but [illegible] upwaters. The mysterious disappe[illegible] be due to the cre[illegible] gas though it [illegible] with the prese[illegible] Rat[illegible] the circle suff[illegible] much from g[illegible] fit an attacl would run about in a frantic fashion [illegible]

Animal [illegible]

[illegible] make of those [illegible] stud[illegible] [illegible] of natural [illegible] a brief [illegible] question of the [illegible] at the [illegible] already all [illegible] There [illegible] question that [illegible] constitute [illegible] In the [illegible] dugout [illegible] there [illegible] at least three [illegible] clamorous [illegible] The other [illegible] seemed to [illegible] them [illegible] there was [illegible] probably because her instinct told her [illegible] and the squealing of her offspring [illegible] But this was often not the [illegible] to [illegible] officer smack the side of the [illegible]

Dry up you little brute[illegible] [illegible] I was told it piled beside the [illegible] the last [illegible] thick They were so numerous [illegible] that they had to take up the flooring and they then found [illegible] tantalizing from four to five years [illegible] plague this rat question would [illegible] nuisance[illegible] On my first morning in the trench [illegible] if there was any food in my mackintosh [illegible] had eaten his way into the [illegible] in the shape of a hunk of emergency biscuit My [illegible] to take it out but I did not do so [illegible] again he would go through the same [illegible] discovered he had [illegible] opposite [illegible] completely [illegible] organized an attack [illegible] killing them in hundreds

The birds that came [illegible] (1) thrush (2) house sparrow [illegible] common about the [illegible] (3) robin (4) [illegible] (5) [illegible] (6) [illegible] yards of my dugout [illegible] of the officers had [illegible] (7) [illegible] (8) blue tit [illegible] (9) [illegible] (10) [illegible] (11) [illegible] (12) [illegible] officers were [illegible] must [illegible] of the night [illegible] school [illegible] trench [illegible] shall [illegible] of the [illegible] visited the [illegible] officers dugout [illegible] would [illegible] perch on [illegible] (Lieutenant O[illegible] Captain C[illegible] party [illegible] [illegible] allowed [illegible] Tit [illegible] about O[illegible] the [illegible] by the [illegible] of some [illegible] shell [illegible] a good shout a [illegible] up to have [illegible] the spot [illegible] about twenty [illegible] where the shell had burst a thrush [illegible] in the [illegible] it was intact and quite warm the mother must have [illegible] out to [illegible] nest but while feeling was

[illegible]

[illegible] noise [illegible] sparkle [illegible] A shell [illegible]

[illegible]

[illegible] only [illegible] huge [illegible] German bullet [illegible] extens [illegible] however [illegible] rifle [illegible]

The [illegible] which [illegible] speak app [illegible] explos [illegible] about [illegible] taking [illegible] considerat [illegible] We will have [illegible] the Verdun district alone up to [illegible] One lorry will just carry ten of their largest shells but [illegible] more of the smaller. Now, suppose all the shell [illegible]

[illegible]

Heat Effects of Hight [illegible]

[illegible] saying that the temp[illegible] explosion of [illegible] amounts according to [illegible] of the [illegible] explosive, but it varies [illegible] explosion [illegible] the open air [illegible] expansion [illegible] maintained at the centre of the [illegible] much less [illegible] to the [illegible] of some [illegible] shell medium [illegible] a very good [illegible] of the principle involved [illegible] battery [illegible] by enemy shell [illegible] performance [illegible] that the result that the [illegible] tree was blown off the lower part and the [illegible] its top part [illegible] instance [illegible] way. In one [illegible] however the [illegible] from the front of the [illegible] with [illegible] and [illegible] to [illegible] the bottom of the crater [illegible] where the shell struck the trunk [illegible] to expansion to the gases while to the [illegible] and then temperature [illegible] [illegible]

Range [illegible]

[illegible] a cunning method of obtaining the range of a battery [illegible] to be concealed in a wood. Such an object [illegible] from the open ground beside itself to range [illegible] with a common shell. A shell is fired by the enemy gunner or an approximate bracketing and the enemy aeroplane watching for the effect sees by the cloud of dust thrown up whether it is over under right or left and to what extent and he signals the result. Now obviously this cannot be done when the objective is in the middle of trees for the simple reason that the little dust and smoke are absorbed by the trees. So a special time less shell emitting a very white cloud of smoke is used and this is burst over the wood. The enemy observer watches for this white puff and by means of a prearranged code, he signals by means of star shell the necessary correction of range.

Medical Arrangements

A [illegible] in the trenches has to [illegible] of his removal. The [illegible] carefully [illegible] to carry a stretcher [illegible] with the [illegible] twists and turns and [illegible] interfere [illegible] stretcher [illegible] disaster [illegible] wounded [illegible] The only [illegible] is to [illegible] carry [illegible] this [illegible] of the [illegible] [illegible] [illegible] type of [illegible] coil [illegible] will [illegible] and [illegible] [illegible]

[illegible] to [illegible] tation [illegible] the [illegible] [illegible] Boul[illegible] [illegible] the [illegible] [illegible] [illegible] to [illegible] in special [illegible] [illegible] [illegible] 100 yds [illegible] [illegible]

[illegible] unable [illegible] content [illegible] exhaustion [illegible] by the [illegible] M[illegible] [illegible] hipper. I [illegible] hit in the [illegible] one's [illegible] the fact that [illegible] bullet [illegible] through [illegible] flash across the [illegible] without [illegible] In addition to [illegible] bullet [illegible]

And [illegible] goes so the [illegible] jumped [illegible] off the [illegible] in [illegible] delight and shakes hands with all his [illegible] saying [illegible] squeezed gone!

On May 29 I had the honour of dining [illegible] the General [illegible] staff. Outside the door of the large apartment stood a head [illegible] large wheel about 15 ft. diameter and [illegible] ft. deep across [illegible] Inside this wheel and running along the treads [illegible] his weight caused the wheel to turn. The axle of the [illegible] through the wall of the house and turned a churn inside and [illegible] the family's butter.

Next day, May 30, I had reluctantly to bid good-bye to the [illegible] with whom it had been my great good fortune to have been billeted [illegible] shortly after dawn I found myself being whirled in a motor car to [illegible] Concealing the car behind some wrecked buildings on the outskirts [illegible] town, we proceeded the remainder of the way on foot. I must [illegible] left of the famous Cloth Hall, wandered through street after street [illegible] desolate and ruined heap of stone town, and not a single building did I see [illegible] which showed some sign of shell damage. Seldom have I [illegible] sight. To think that this town has weathered [illegible] to this. And as I gazed at the mangled and crumpled [illegible] fine old Gothic edifices the venomous shell were still being [illegible] the skeletons of the buildings. And there rose up in my [illegible] time of the great Revolutionary Post that seemed peculiarly applicable to the authors of such diabolical outrages —

> [illegible] Nature forbid and rending all the [illegible]
> Still [illegible] the brain and sweep the brain [illegible]
> [illegible] to hum the [illegible] to lower [illegible]
> [illegible] [illegible] the feast then [illegible]

Although there is comfort in the thought that [illegible] to [illegible] those who are strangers to honour, and whose [illegible] the stalking relentless Nemesis who will hit in [illegible] unhurried. To them there units in [illegible] turned away from the city of lifeless choose [illegible] unobserved for post finished up at Brigade Headquarters [illegible] lunch. By 3 p.m. we had all collected together [illegible] minutes were waving adieu to the Staff Officers from [illegible] received Brigade at 7 p.m. but did not leave until [illegible] Marshal [illegible] motored across the Channel and arrived [illegible] Orleans [illegible] to have left town for [illegible] Dieppe to be postponed as the Grand Fleet was [illegible] June 5. Mary Hutchison of H.M.S. Delaware [illegible] in [illegible] tons buses were entrusted [illegible] the [illegible] Mary [illegible] passage arranged on the same [illegible] Mary [illegible] Black Prince and Warrior with [illegible] returned to their posts. The [illegible] with crept on [illegible] in [illegible] slowly towards H.M.S. Shannon [illegible] rendezvous of which I can hear at 10.30 p.m. next day, June 5.

This [illegible] and my visit to the trenches. Never should [illegible] care and much the officers and men in those trenches [illegible]

that our sailor[illegible] [illegible] thoroughly good time and ever shall I treasure in memory the [illegible] which I personally received at their hands. Speaking for myself I [illegible] all too brief visits for that one can [illegible] in ten days really only amounts to a glimpse. Nevertheless [illegible] brought me [illegible] and has left me the richer, for I have [illegible] in my cabin until the misery [illegible] there rises up before me a vision [illegible] I see [illegible] dimly lit space vaulted above by [illegible] steel, flanked [illegible] wooden battens and sandbags [illegible] and floored [illegible] mud. The entrance to [illegible] is closed by a [illegible] or screen of sackcloth, and as [illegible] flash of brilliant light and [illegible] like a falling [illegible]. Also comes in through the [illegible] medley of [illegible] which the tiger-like purring of [illegible] in the [illegible] lungs the popping [illegible] the [illegible] hollow of trench [illegible] the smoke-laden atmosphere [illegible] table the bronzed faces of [illegible] together. The sucking [illegible] steel helmet followed by a [illegible]. There is a sharp [illegible] correct [illegible] into the trough of a large [illegible] This [illegible] stick to it [illegible] for trouble. [illegible] I [illegible] by someone [illegible] a number of large logs at [illegible] and a sleepy [illegible]

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Clinical and Practical Notes.

OBSERVATIONS ON INFECTIOUS CASES TREATED IN THE R.N. HOSPITAL SHIP "ACADIA."

By Staff Surgeon Donald Walker, M.B., R.N.

For twenty months with the exception of a period of six weeks in the spring of 1916 this Hospital Ship has admitted infectious cases at a large naval base. The figures which it is proposed to record refer only to actual cases of zymotic disease there for the interval in 1916 being, very kindly supplied by Staff Surgeon Hastings, R.N. Cases sent for observation which proved to be non-infectious and contacts with the exception of those of cerebro-spinal fever are not included.

These statistics are and must be incomplete. There is no information available as to the number of the population from which the cases were drawn, and moreover it was constantly changing. With regard to ages all the personnel of the Fleet there are no figures nor can the proportion of boys be given. It may be assumed however that the cases refer to a large body of healthy men the majority of whom are between the ages of twenty and forty. The distribution of the population of a naval base differs from that of an ordinary community and may be represented as a number of independent units among which infection is easy and is not being itself densely populated and the conditions favourable to the spread of disease if precautionary measures are not taken. The absence of extensive epidemics especially when one has severe infectious diseases concerned and the large proportion of ships sailing once are only indicates how successfully preventive measures have been applied.

The total number of cases of infectious disease admitted to the ship in each year there was [illegible] in 1916 [illegible] practically [illegible] in the autumn. This falling off is partly accounted for by the low incidence of the autumnal fevers, scarlet fever, diphtheria and enteric fever.

The following table shows the diseases in order and the percentage they form of the total.

Disease	No.	%	Disease	No.	%
Rubella	11	14·08	Enteric	1	[illegible]
Mumps	500	[illegible]	Erysipelas	1	[illegible]
Measles	41	7·11	Varicella	1	[illegible]
Scarlet fever	2	1·38	Cerebro-spinal fever	[illegible]	[illegible]
Erysipelas	17	[illegible]			

The bulk of the admissions were for rubella or measles, the most severe exanthematous illnesses, for rubella 21·11 per cent of the total number.

The cases were received from 110 ships and two shore batteries. Only seventeen ships (15·5 per cent) sent more than [illegible] cases during the whole period and forty-three ships (39·09 per cent) sent one case only. The maximum number of cases from any one ship was thirty-five.

The next table gives the age incidence for rubella, mumps and

[illegible] the incidence [illegible] years and [illegible] those un[illegible]

[illegible]

[illegible] enlargement [illegible] associated with [illegible] blood

[illegible] (50 per cent) [illegible] half of the year

[illegible]

[illegible] cases [illegible] for treatment from [illegible] cases are distributed through the year 1916

Sixteen ships [illegible] only (10 per cent) [illegible] number from a [illegible] six that this represents [illegible] with an intact [illegible] Complications were [illegible] case of moderate [illegible] The rash was hemorrhagic [illegible] contained in a [illegible] N B from Acclomdland and [illegible] and [illegible] the Orkney. The latter was complicated by [illegible] probably the result of an attack of severe sore throat [illegible] [illegible] The rash was hemorrhagic [illegible] [illegible] was attributable to measles itself appears to be [illegible] [illegible] Stevenson [illegible] and—[illegible] N B [illegible] severe [illegible] [illegible] the other [illegible] [illegible] the pressure was prolonged [illegible] asthma [illegible] of several years duration [illegible] were [illegible]

This [illegible] model is highly infectious should [illegible] to [illegible] Probably there is a [illegible] of immunity [illegible] must be under the present circumstances [illegible] from the [illegible]

Sir [illegible] The [illegible] apparently [illegible] Twenty six ships were [illegible] of [illegible] and the [illegible] ship [illegible] and no [illegible] Scarlet fever [illegible] occurred once and only [illegible] [illegible] this was recent

[illegible] of interest to note that one patient a stoker 20 [illegible] appeared to [illegible] with a history of [illegible] sore throat [illegible] and erythematous [illegible] The [illegible] temperature [illegible] 101° [illegible] punctate [illegible] the [illegible] of the [illegible] associated [illegible] tonsillitis following [illegible] the other [illegible] attack [illegible] associated [illegible] 103) [illegible] accompanied by [illegible] in the neck [illegible] the [illegible] of the [illegible] the [illegible] of the [illegible] symptoms [illegible] The [illegible] second attack occurred [illegible] and suggests that [illegible] the patient at the [illegible]

Lupulas —Seventy [illegible] ships [illegible] this heating three ships [illegible] successfully [illegible] supplied from the pulsometer [illegible] at Greenock The [illegible] over and fifty to sixty [illegible] days if necessary The following [illegible] cases

(1) P O Telegraphist [illegible]

disease with an area of redness and inflammatory oedema [illegible] forehead and cheeks. One dose of vaccine cut the disease [illegible] was treated locally with zinc oxide and starch powder.

(2) A. E., aged 49. Placed on the sick list on board ship on [illegible] fever with an unhealthy wound six days old. The wound healed in three days; headache, pain in eyes and nose with such [illegible] A day later the erysipelatous condition had spread over the face [illegible] edema of the neck was present. On admission the character [illegible] edges were present and there were small raised areas on the [illegible] Two doses of vaccine cleared up the condition. Local treatment [illegible] of ointment.

(3) A. [illegible], aged 35. This was a mild case with the disease confined [illegible] of the neck. A raised edge was present at some [illegible] One dose of vaccine gave a good result. Local treatment zinc [illegible] ointment.

(4) R. A., aged 24. Admitted second day with a [illegible] on right cheek and nose with a definite border. On [illegible] the disease was spreading on to the [illegible] and vomiting occurred. One dose of vaccine was followed by [illegible] improvement. It was repeated once. Local treatment [illegible] ointment followed by zinc oxide and starch powder.

(5) Stoker R. N. R., aged 30. Admitted on third day of [illegible] of face and neck and involved in the cheek. A loose [illegible] all the margin was raised and indurated. There was [illegible] One dose of vaccine produced marked improvement [illegible] ointment, fomentation.

(6) O. S., aged 23. Admitted on third day with sore throat and [illegible] A rash was present in both flexures of both [illegible] the deltoid indurated right and resides on the surface. [illegible] Local treatment zinc oxide ointment.

(7) Private R. M. L., aged 18. Admitted on 15th day of illness [illegible] been under treatment for sore throat [illegible] and swelling of the left side of the nose. [illegible] On admission the following were noted: [illegible] of the forehead, the eyebrows, except [illegible] is involved. [illegible] erysipelatous infiltration indurated with raised edges. On the [illegible] there were a large number of scabs and vesicles containing yellow [illegible] pus, partly running away. At the root of the nose the inflammation is spreading upwards on to the forehead. The eyelids are [illegible] edematous. Nasal obstruction existed. Zinc oxide ointment was given [illegible] Two doses of vaccine were given with rapid improvement.

The other cases of interest. The junior stoker R. N. R., aged 30, was admitted to the hospital ship Garth Castle with myocardial [illegible] The previous history of [illegible] and, when examined, the [illegible] of the pulse was found to be [illegible] tension, fluttering, and irregularity [illegible] Consciousness was not lost. This patient developed [illegible] On admission digitalis was exhibited and the ordinary supportive treatment employed. The accompanying chart shows the course of the disease. It will be observed that a relapse occurred on the twelfth day. The interest in this case lies in the immunity to the toxic condition that the circulatory system appeared to enjoy. In spite of the long fever the condition of the heart readily improved five days after admission when the rectal temperature was 100.1°, the pulse was noted to be

much improved in [illegible] and more regular. B[illegible] fire had been normal a week, the pulse w[illegible] volume and of normal frequency.

Diphtheria.—Two [illegible] of this disease [illegible] cases were received from [illegible] ships, five and [illegible] of mild type and no complications occurred.

Enteric Fever.—Ten cases of enteric fever [illegible] and all them were received from fifteen ships. The [illegible] of the disease was [illegible]. Nine of the [illegible] had been [illegible]. In six [illegible] the attack was very mild [illegible] confirmed in all by the presence of Widal's [illegible] severe character was complicated by [illegible] culture of typhoid bacilli was obtained [illegible] developed in the right iliac fossa [illegible] become normal. The appendix should [illegible] removed and the case improved quickly. [illegible] perforation. Two deaths occurred—one [illegible] hæmorrhage from the bowel. In the second [illegible] mem of nephritis with marked bacilluria. [illegible] shell fish shortly before the attack [illegible] percent.

Varicella.—This malady only recurred [illegible] ships sending one case each.

Cerebro-spinal Fever.—Nine cases in all [illegible] during twenty months and they were all received [illegible] in ships. The following table completed from a right [illegible] connect and the results. The date at which further [illegible] appears to be an important factor.

[illegible]	[illegible]	[illegible]	[illegible]
1	3rd [illegible]	Pirbo Da[illegible]	[illegible] Died Cerebro[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
3	2nd	[illegible]	[illegible]
4	3rd	Sotur[illegible]	[illegible]
5	[illegible]	Serum Pain [illegible] and Fever	Recovered
6	2nd	[illegible]	[illegible]
7	4th	Sotur[illegible]	Died
8	[illegible]	[illegible]	Recovered

Contrast Cerebro-spinal Fever.—Fifty [illegible] have been examined for the presence of meningococci [illegible] were found to be positive—a percentage of [illegible] per cent. Sick [illegible] on board have been examined thirty [illegible] times and twenty-eight other ratings from ships who were not contacts have also been investigated. They were all negative.

My thanks are due to Temporary Surgeon G. W. Carte, R.N. for assistance in collecting the figures in this article.

A CASE OF PULSATING EXOPHTHALMOS

By First Sergeant [illegible] Shand [illegible]

The following case is of interest from a surgical anatomy point of view.

A B[illegible], aged 34, was admitted on August 30, with the following history. On August 29 he was struck on the top of the head by a [illegible] from the foretop on the signal bridge.

A lacerated wound was inflicted across the top of the head. The bone was not fractured though there appeared to be some depression on the right of the middle line. He was unconscious when seen and there was no hemorrhage from the mouth and nose with stertorous breathing. There was no hemorrhage from the ears but some œdema of the right [illegible]. The pupils were equal in size. Consciousness returned in about [illegible] after the accident.

He [illegible] was treated at [illegible] he was discharged to a hospital ship where he [illegible] discharged to a naval ambulance train on August 30, and arrived at Portsmouth on August 30.

On [illegible] 17 [illegible] sign.—Wound partly healed; right eye was bulging, a little [illegible] flattened. There was a subconjunctival hemorrhage. He complained of some pain in the right eye and inability to sleep in consequence.

The condition remained stationary for some time. The scalp wound healed. The ocular conjunctiva commenced to swell on September 17, and a definite to and fro murmur—which he said he could feel in his head—was then noticed in the eyeball. Pulsation in the eye could be felt. A loud systolic murmur over the orbit was distinctly heard and the phenomena of arteriovenous aneurism in the cavernous sinus were made. Pressure on the right carotid artery lessened the pulsation in the eye. The circulation of the left carotid was normal. He complained of a dull pain in the orbit and all over the right temporal region.

The condition of the right eye was such that he was unable to [illegible] his [illegible]. The exophthalmos was visibly increasing, and all the [illegible] were [illegible].

On September [illegible] the right common carotid was ligatured opposite the [illegible] the ligature being applied with deliberation and notice [illegible] to the cessation of pulsation in the eye before the [illegible] was tied. The operation was successful.

The [illegible] exophthalmos rapidly subsided. The wound healed. The [illegible] improvements returned gradually. Slight [illegible] noticed till October 10. Except slight dimness of vision the [illegible] was perfect. No cerebral symptoms were noticed and the man [illegible] left at his depot on November [illegible].

The condition of the fundus was interesting. Retinal veins were [illegible] dilated and continued dilated; and the arteries were considerably smaller than on the opposite side. The condition was obviously that of fracture of the base of the skull injuring the carotid artery in the cavernous sinus.

A recent discussion concerning Graves's disease suggests to one's mind a relation with the above case dilation of the cavernous sinus as a

possible cause of the exophthalmos, bearing in mind the vasomotor disturbances peculiar to this disease.

I am indebted to Temporary Surgeon C. L. Grubbett for assistance in this case.

AN EARLY CASE OF SCURVY

By Staff Surgeon WILLIAM H. LOGAN, R.N.

It is hoped that the following remarks may prove of interest since they have a bearing on the conditions of living in some of the small craft now employed in the Service, and on preventive medicine.

A Sub-Lieutenant, R.N.V.R., serving in a motor launch consulted me in February of this year, saying that he felt generally unwell and was easily tired. The pulse and temperature were normal and he had no special symptoms except that his gums were sore and he feared that he might be suffering from pyorrhœa. The gums were pale and bled easily on pressure but the teeth, with the exception of two which were slightly decayed, were in good condition and firm in the mouth. He was not taking mercury in any form.

On inquiry patient said he did not get much vegetable food on board his boat. This I find is often the case in small craft, not so much from the difficulty in procuring, this article of diet as from lack of initiative on the part of the cook, who is usually a deck hand.

Though I suspected that this officer's condition was due to scurvy, the symptoms were too indefinite to be conclusive, so I prescribed an antiseptic mouthwash and told him to see me again. A few days later he came to me and said that he was feeling worse in all respects and that he noticed up in the mornings to find his gums caked with blood. This I took to support the diagnosis of scurvy, so I immediately prescribed lime juice to be taken daily with meals. The improvement in the patient's condition was as rapid as it was gratifying; he lost his uneasy happy feeling, much better in every way and had no trouble with his gums. The patient was now proceeding on a week's leave and asked me if he should see a dentist at home. I advised him to do so in order to have the small defects in his teeth attended to. On his return he tells me that his dentist concerned with the diagnosis of scurvy and remarked that he had seen several similar cases in officers employed in motor launches.

Besides this definite case I have had several patients from motor launches suffering from boils and other such conditions which I have suspected to be due to a deficiency of vegetables in the diet and in these cases I have lime juice instead of the more usual acid mixture. I have advised the issue of lime juice to the crews of all motor launches attached to this ship.

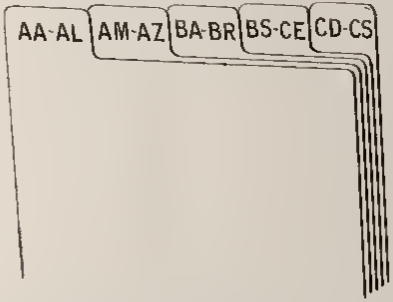
In lieu of the large number of small craft in the service in which owing, to the absence of a trained cook the diet is apt to be unvaried I trust the above remarks will be of some value.

THE CARD INDEX SYSTEM APPLIED TO MEDICAL RETURNS

By Surgeon H. E. B. Stephens, M.B., R.N.

Many methods are employed at present in the compilation of the nosological and nosological returns, all of which possess one or more advantages. Nevertheless, generally speaking, the assembling of these tables at the end of the period for which they are due remains a source of anxiety and trouble to some medical officers. This brief account of a useful practice, tested by experience, is written in the hope that such difficulties may be reduced to the minimum by keeping both the above mentioned tables up to date. Thus the accumulation of a mass of uninteresting labour at the end of a quarter or a year may be prevented.

Almost everyone is familiar with the main idea of the card index system, but for those who have not studied the question a brief description will suffice. An oblong box with a close fitting drawer holds a thousand cards or more when filled. The cards themselves, which may be of any convenient size when filled in, are placed in position behind the guide cards. The latter are of the same size but possess a projecting tab on the upper border, which denotes the heading under which the information on the card falls. These guide cards are arranged in series of five—the tabs running across the width of the box. The first row would appear thus on pulling out the drawer:—



These guide cards may be coloured to facilitate recognition, but this appears hardly necessary in dealing with such a small number of cases in a ship. In hospitals or depots where the list runs into thousands

[illegible] Mess [illegible]

The method [illegible] examples. W[illegible] list are cop[illegible] charged [illegible] its proper [illegible] from day to [illegible] ing to desig[illegible] in thus [illegible]

[illegible]

The nosological [illegible] cross index. [illegible] thousand cards [illegible] usually [illegible] cards in this [illegible] denote the [illegible] name [illegible] tabs being arranged in order [illegible] have as [illegible] from under [illegible] of interest [illegible] could be [illegible] this fashion

Brown [illegible]	[illegible]	[illegible]	[illegible]
Davis J. H. W.	[illegible]	[illegible]	[illegible]
Smith [illegible]	[illegible]		[illegible]
Clarke [illegible]	[illegible]		
White [illegible] Edward H.	[illegible]		
Robinson J. H. B.	[illegible]	[illegible]	[illegible]
Jenkins [illegible]	[illegible]		[illegible]

Thus the card of each [illegible] and [illegible] number of days sickness and whether discharged [illegible] under treatment and total days sickness [illegible] addition. Such a list enables the general [illegible] without the waste of time usually associated [illegible] cases from the ordinary sick list. A [illegible] disease is at one's finger tips at any given moment [illegible] case details with a temperature chart on the [illegible] and are obtainable from Messrs. John Bale, [illegible] the publishers of the Journal.

The daily sick list is written up as usual [illegible] by the adoption of this scheme these two principal [illegible] date—not an unimportant advantage when a medical [illegible] leaves his ship or establishment at a moment's notice. Should [illegible] catastrophe occur, every detail is available, and merely requires to be [illegible] into the official tabulated form. Simplicity and accuracy are [illegible] by the method—in fact they are the keynotes of the system—and those who value such qualities may be prepared to give it at any rate a [illegible] trial.

Many details of improvement will no doubt, suggest themselves [illegible]

Q

medical officers [illegible] ments. The [illegible] may be elaborate [illegible] itself to [illegible] they large or [illegible] is kept [illegible] greater the [illegible] the [illegible]

The cost [illegible] and [illegible] lifting box and [illegible] plane [illegible] 8s or 10s per [illegible] to [illegible] [illegible]

In conclusion [illegible] Shannon [illegible] which [illegible] carpenter [illegible] would [illegible] of [illegible]

It [illegible] thus [illegible] labour [illegible] force. The [illegible] environment [illegible] to the daily [illegible] [illegible] and

[illegible]

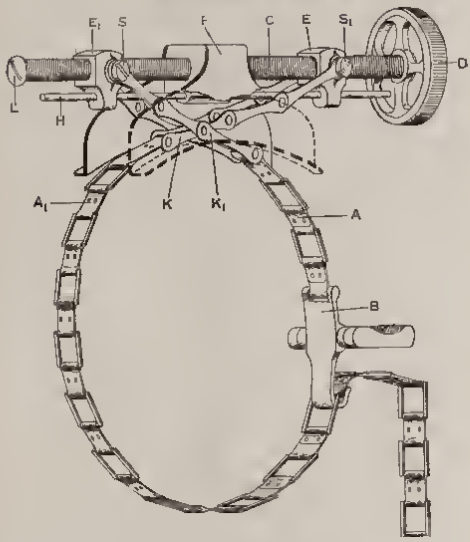
The [illegible] experiments made by [illegible] Portsmouth to [illegible] [illegible] ments I was convinced [illegible] [illegible] piece of metal would [illegible] work.

The design [illegible] no [illegible] to suppose that this [illegible] professional [illegible] The case will [illegible] with which [illegible] are can be [illegible] of cost [illegible] can be rapidly [illegible] to desired [illegible] these points [illegible] article in [illegible] The [illegible] punishes with [illegible] property is [illegible] difficult. We [illegible] applied [illegible] of pressure [illegible] less it be [illegible] and put [illegible] to [illegible] haemorrhage the pressure [illegible] gradually [illegible] The [illegible] of its [illegible] of haemorrhage in a case of [illegible] that it [illegible]

[illegible] allowed by the metal [illegible] but in case and in many other [illegible] that venous [illegible] without [illegible] operations proceeded I have [illegible] patient [illegible] would have been thought [illegible] With this carefully

regulated pressure th[illegible] loss and sometimes absent

There can be no doubt th[illegible] of this metal tourniquet rende[illegible] be the case



A new metal tourniquet

in any instrument of rubber or wabbling. The safety and value of its assistance is very marked when dealing with cases of traumatic aneurysm varicose aneurysm and aneurysmal varix

The to[illegible]

Chain [illegible] C handwheel D [illegible] L and [illegible] H

The chain [illegible] plate hook [illegible] cleat the metal bound [illegible] Their [illegible] open links and con[illegible] together in a lap joint by means of [illegible] heads

At one end of each [illegible] K and KI have been fitted on [illegible] side of the chain [illegible] that the links of one chain will work [illegible] through the holes [illegible] chain

The securing hook H [illegible] in one piece being secured to [illegible] chain by means [illegible] brass countersunk rivets the hook [illegible] engage in any open link of the [illegible]

The operating screw [illegible] steel with a right-hand two start [illegible] and [illegible] two start thread on the other and [illegible] to the [illegible] of the screw has been fitted with [illegible] and the other [illegible] is square fitted, also a tapped hole [illegible]

The [illegible] with a milled rim [illegible] metal and have been screwed with a [illegible] thread S the other [illegible] each nut has a hole drilled in the [illegible] portion to fit the guide rod H

Links have been tapped on each side of the nut and shouldered screws S and SI fitted to securing the chains to the nuts

Bridge with bearing [illegible] bridge is of brass sheet in one piece flanged over on each side to a width of $\frac{3}{8}$ in

The whole of the parts have been nickel plated The milling of the operating screw C is so arranged that the apparatus is automatically locked whenever the winding stops

The breaking strain of the chain is over a quarter of a ton

Before using the tourniquet it should be seen that the nuts L and LI are in contact with the bridge E

A towel or lint should separate the apparatus from the skin The instrument can be boiled

The instrument can be obtained from its makers, Messrs Johnson and Phillips Victoria Works Charlton Kent The price has not been fixed, but it will be higher during war than in peace

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THE IDEAL SANITARY DUSTBIN A SUGGESTED STANDARD PATTERN FOR THE NAVY

By Fleet Surgeon ARTHUR GASKELL C B, F R C S, D P H I S T

The facts which are intended to be proved in this paper are —

(1) An important step in sanitation is the safe and cleanly disposal of refuse

(2) Refuse of the petty untidy kind, if improperly disposed of is hardly conducive to ill health

(3) The London County Council pattern dustbin is not good

(4) The Navy lives ashore as well as afloat and therefore requires instead of

[illegible] small dustbins are preferable to one [illegible]

[illegible] Therefore I establish one sealed pattern [illegible] supply [illegible] of these rather than large unwieldy ones.

The good dustbin must be sufficiently strongly built; it shall not [illegible] bitten out of shape by rough usage. It shall have shall always sit properly and prevent the entry of rain and [illegible]. It must however be sufficiently light when full to be easily [illegible] by one man up the dust cart ladder and tipped comfortably into the cart.

Quite apart from the facts that refuse often contains germs of disease that it is a breeding place for flies which carry disease germs, that it may be a good medium for the growth of moulds and putrefactive organisms and that it may give off poisonous gases and malodorous smells there is the undoubted fact that the untidiness and filthiness of refuse lying around the habitations of man have a demoralizing effect on the mind and body and the least active of discipline and orderliness a carelessness of habits which usually leads rapidly to a general deterioration of health.

But it is perfectly useless to give orders that a camp or grounds or building are to be kept clean unless means are provided for carrying out those orders and whenever one thinks the matter carefully out the sanitary dustbin or its equivalent stands out as one of the first appliances to be provided.

All this may appear to the reader as too self evident to be put in writing but it is these self evident matter which are often left unobserved and later in this paper certain examples of this may be quoted. The really sanitary dustbin embodies the first step in the safe and cleanly disposal of refuse.

Before taking the London DPH [illegible] it is necessary to produce a certificate of having worked with a medical officer of health. The writer found this work at Greenwich extremely useful and instructive and in going round the poorer districts with the sanitary inspector one of the most striking facts observed was the shortcomings of the usual sanitary dustbin. Even the London County Council's [illegible] was so battered about by the instruments that it could [illegible] be collected. Indeed it was usually soon unable to hold the intended body and is consequently often left off with the result that [illegible] and consequently wet thus helping fermentation and flow into paper and objectionable dust broadcast and thus swamping [illegible] and around the dustbin especially those of the fish shops which [illegible] the principal contents.

In the Royal Naval College [illegible] old bin dustbins of the time of Queen Anne still were in use. After the objections [illegible] pointed out they were done away with. The stock of old bins [illegible] among the stores of the College for sorting [illegible] were found. But these had long since been demolished [illegible] obtain thoroughly strong metal [illegible] that they were [illegible] and manipulate them even when empty. The ordinary pattern [illegible] County Council ones were then bought in [illegible] all.

Since the outbreak of war the writer has [illegible] Director of Medical Services of the Royal Naval Division. In the camps at Walmer and at Blandford [illegible] also in the camps at Fort Salisbury [illegible] the Gallipoli Peninsula a glaring necessity was the sanitary dustbin.

Within [illegible] led to those conditions [illegible] such but in the camp at Blondie [illegible] on a special cement tray or pedestal but this [illegible] On the Gallipoli Peninsula the dirt left behind by the [illegible] and a sanitary scheme was drawn up for a thorough [illegible] of the whole area occupied by ourselves and our Allies [illegible] It became evident that the camps of dug outs were difficult to keep [illegible] scraps of food [illegible] because the supply of empty kerosene tins [illegible] It would have been a great advantage if a special sanitary [illegible] could have been provided at the end of each bed but it was not [illegible] possible to obtain those up to the time of the withdrawal from the [illegible]

It may be objected that the subject of this article is too simple or that the Navy is the last place where seyoes need [illegible] themselves about the disposal of refuse With the Navy the sanitary division [illegible] to receive and purify all refuse

Now seyoes with a knowledge of the Navy knows that nowadays there are a very large number of naval establishments ashore. The naval barracks, naval hospitals training establishments dockyards air stations &c. are a few examples of naval shore establishments and in all of these the sanitary dustbin is a necessity

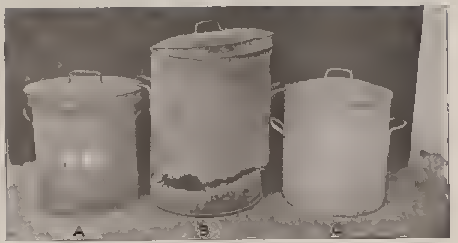
At the Cape Naval Hospital the patients spend most of their time day and night on the beautiful verandahs One result of this out door life is a certain amount of rubbish old cigarette packets, scraps of bread &c &c, are thrown on the ground around It is proposed to place a small covered sanitary dustbin at each end of every verandah and into this can be placed anything to be thrown away

From what has already been said it is obviously of the greatest importance that the ideal sanitary dustbin when full shall be sufficiently light to be easily carried and emptied by one man and that it shall also be sufficiently strongly built to keep its shape in spite of rough usage This can only be done by having a small dustbin and therefore the axiom may be laid down that *if there be a large amount of refuse do not supply larger dustbins but have a greater number of smaller dustbins* in short, establish one fixed sealed pattern once and use no others.

At first then we come to the main point of this paper What should be the exact dimensions and construction of this ideal dustbin? It may be said that 60 lb is the weight a man can carry and deal with It is found that a cubic foot of average dustbin refuse weighs about 33 lb A cylindrical dustbin 18 in high and 15 in in diameter would contain rather more than 1·5 cubic feet or about 60 lb of average refuse This, then leaves 20 lb to be the weight of the empty dustbin

Such a bin has been made for the hospital and is under trial The lid is made simply large and its flange fits loosely outside the body instead of inside thus allowing of its fitting over if the bin be somewhat knocked out of shape This bin has so far lasted well and it is proposed to continue this practical experiment until the ideal dustbin has been evolved and then to submit it to the Admiralty for approval as the sealed pattern for universal use in naval establishments ashore

No apology appears necessary for the verbosity of this article as the reader will appreciate that a certain amount of recital of personal experiences is necessary to prove the points stated at the beginning



The illustration shows three dustbins —

A is the suggested ideal dustbin it weighs just over 20 lb

B is one of the hospital dustbins which has been just over one year in use and cost 12s 6d when new

C is a new dustbin issued from store it weighs about 12 lb and is practically the same size as A It is to be tested alongside A to see the relative durability of the two

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A SIMPLE X RAY COUCH FOR USE AFLOAT

By Lieut Surgeon JOHN MARTIN R N
AND
Surgeon H H HOLLY M D D H R N V R

The portable x ray apparatus supplied to H M Ships (Newton's [illegible] or Newton and Wright's 1914), though excellent in most respects has the great disadvantage that it is primarily intended for fluoroscopy at the present and cannot be easily manipulated below the patient for screen work or the localization of foreign bodies It is true that the barrel rotating the tube holder gives a certain amount of movement in three planes but this involves repeated loosening and tightening of screws and wastes much time so that one generally finds it easier to adjust the patient to the x ray tube and not the tube to the patient

In order to overcome these difficulties we had a table made on board which, whilst simple in construction gives quite as good results as any high priced x ray couch

First we had an ordinary wooden table built 6 ft by 2 ft 6 in, the top being made of five ply wood

At a distance of 16 in from the top of the table a strip of wood (A) rectangular in section is inserted along the whole length of the table on

either side [illegible] to carry a framework which supports the tube holder in [illegible] position (fig. 1). This framework is likewise constructed of two [illegible] pieces of wood (B) joined together on either side of

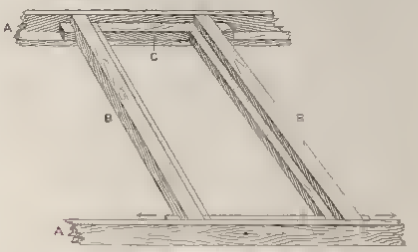


Fig. 1. [illegible]

[illegible] a perfectly smooth strip (C) which slides along in the [illegible]

In a similar manner the tube holder slides from side to side in the

grooves [illegible] the tube can [illegible] any part [illegible] that is required

With [illegible] kathode is [illegible] from the [illegible] working distance [illegible]

At the [illegible] the antikathode [illegible] 20 [illegible] length is attached to the [illegible] holder horizontally [illegible] the extremity of this holder a slot [illegible] (fig 2)

From the [illegible] hangs a [illegible] which is counterpoised by a second weight so that it will [illegible] and this plumb line is fixed in such a [illegible] that it [illegible] over the centre of the aperture in the tube holder (p[illegible] when the table has been fitted

Care must be taken that the handle is [illegible] exactly to the centre of the tube holder either by a T piece or [illegible] forks otherwise the plumb line will not register correctly

With a table thus constructed one can [illegible] sure that the median ray passes through the exact spot [illegible] in the patient's joint or limb screening a patient is rendered a [illegible] simple process and of course for any attempt at accurate localisation of a foreign body some apparatus of this kind (with plumb line or other attachment) is essential

Extracts from Official Journals.

Staff Surgeon L. V. G. Wilkinson writes on the Drug [illegible] Service Afloat Scale:—

An examination of the list of these drugs will show that a [illegible] able number are scarcely ever used and at the end of a commission [illegible] retained to store sometimes with the contents of the bottles [illegible] untouched. Many of these drugs have fallen into disuse owing [illegible] to advancing learning discovered or owing to the fact that their [illegible] may be performed apparently just as well by other drugs on the [illegible] afloat scale. Again there are many diseases and I would [illegible] ticularly mention skin diseases, which are not catered for sufficiently and consequently many of these cases are sent to hospital for treatment whereas with a little variety of drug, they might quite easily be treated on board. There is also another point which I should like to put forward. It is that the amount of chloroform in the service afloat scale is double that of the ether supplied. I maintain that this is wrong. In all London hospitals the general anæsthetic upon which most reliance is placed is undoubtedly ether. In all the Naval hospitals ether is the anæsthetic par excellence. One is taught that ether is less dangerous than chloroform and that in the vast majority of cases it ought to be administered. This is particularly true now that the open method of administration is in use. Why then, if this is the teaching and I affirm it is, is the amount of chloroform double that of ether? The anæsthetist uses ether with equal facility but not so the individual who is called on to administer chloroform seldom. The reason for this perverted standard in the scale afloat may be that chloroform is cheaper than ether or occupies less space, and perhaps the originator of the scale did not realize the important position ether holds in the London schools.

The drugs I consider might be dispensed with or replaced by other drugs are the following: Antimonium tartaratum, calx sulphurata, creta aromatica c. opio, extractum argotæ, ferri sulphas exsiccatus, liquor ejusposticus, pilulæ colocynthidis compositæ, potassii nitras, tinctura aconiti, oleum crotonis, tablets of pepsin, bismuth and strychnine, tabellæ of podophyllin and hyoscyamus, and pulvis ipecacuanhæ.

My reasons for choosing the above drugs are:—

Antimonium tartrate as an emetic is very depressant and its place is taken by more suitable drugs. It is not now considered necessary to reduce the force and frequency of the pulse in febrile affections. The expectorant effect may be valuable in early stages of acute bronchitis to promote free excretion, but other drugs are of equal value.

Calx sulphurata is used chiefly as an anti-suppurative in furunculosis. Sulphuric acid in large doses is said to be more efficacious.

Creta aromatica c. opio.—For this might be substituted either creta aromatica or prepared chalk. The exhibition of opium is not always required when chalk is prescribed, the aromatic chalk with opium tice the prescriber down.

Ergot —The results of giving this drug to control haemorrhage from various parts of the body are very contradictory except in the case of post partum haemorrhage It seems it this is true that the drug might be left out from the scale

Tannic acid —As a haemostatic —in such cases as bleeding from a tooth socket—extracted alum or a benzin tincture the tannic There is both a solid preparation and a perchloride in the official scale

Liquor ferri appears to be very seldom used and I think that this preparation may be frequently returned into store unopened

Pilula hydrargyri —There is already the colocynth and hyoscyamus pill on the scale There seems no necessity to include this preparation as well

Potassium iodide —The therapeutic value of this drug is apparently very small As a diuretic and diaphoretic either the acetate or citrate of the metal may be preferable

Acetate of potash —Acetate is a drug that has fallen out of use in disease Acetonum, to Order it might be more frequently employed than it is and certainly in some modern handbooks it is recommended for catarrhal affections of the upper respiratory tract but the large quantity evidenced by the frequently untouched appearance of the bottle on shelves to stock is seldom used in the Naval Service

Oil of croton —This drastic counter irritant seems so seldom employed that it might be cut out with advantage In cases where it is used internally jalap or some other less irritating cathartic could be equally well employed

Podophyllin and hyoscyamus tablets —This preparation seems so seldom employed that some more generally used drug might be substituted for it with advantage

Pulvis ipecacuanha —As an emetic under certain circumstances ipecacuanha is good, but we have the vinum in the scale The giving of large boluses of the powder in dysentery has been quite replaced by emetine

It is not to be denied that all the above drugs and preparations of drugs have their uses, but on consideration one can but draw the conclusion that they though not exactly superfluous could be with some advantage replaced by others which we have not In the Navy skin diseases are of frequent occurrence from mild forms of dermatitis to the acutest forms of eczema and the most chronic and stubborn forms of psoriasis From the number of drugs enumerated by various writers on skin diseases, it is obvious that more variety is wanted

The drugs and preparations I have proposed to cut out from the scale might be replaced by others which I venture to put forward They are all common enough in general practice —

Chrysarobin either in the form of the B P ointment or in the form of chrysarobin paint

Calamine —This is an exceedingly cheap and useful drug—many cases of eczema have improved rapidly under its treatment in ships on home which I have served

Liquor carbonis detergens, ichthyol and hydrargyrum ammoniatum —These three drugs might also be considered I am of the opinion that a great many of the skin cases which either remain for long periods on the

sick list or else go to hospital could be treated successfully on board if the above drugs were supplied.

Potassium citrate or acetate might replace the nitrate which is now supplied.

Prepared chalk or aromatic powder of chalk should take the place of the aromatic powder of chalk with opium.

Iodoform or a substitute should be included in the scale. Patients are constantly asking for this drug as it relieves many forms of neuralgia and headache like a charm.

Some silica organic preparation should be included in the scale. The treatment of gonorrhœa is difficult, when permanganate of potash fails, as it sometimes will. Protargol is an effective local application but is very expensive. There is a cheaper and more efficacious remedy than protargol which is but little known; it is also one of the silver organic compounds—I refer to argyrol.

Flavouring agents might be supplied in the form of strong concentrated tinctures of essential oils from which various syrups or "squashes" can be made. The commonest and perhaps the most useful of these flavouring reagents are perhaps tincture of orange, tincture of lemon and the oils of cinnamon and caraway.

There are many other drugs whose use is well known which might easily find a place in the service about scale, some of which are very important such as hydrogen peroxide, resorcin, menthol, compound liquorice powder, borax and paraldehyde.

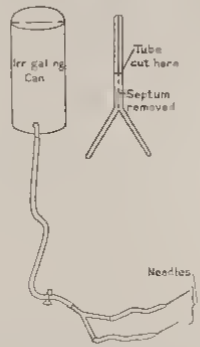
Staff Surgeon A. D. C. Cravanas writes on Disinfection on board H.M.S. Diamond of Mumps.—

For disinfecting purposes formalin either in vapour or solution was [illegible]. In this class of ship, owing to numerous watertight doors [illegible] the vapour method fumigation was applied should a case develop. All hinges of hammocks were opened out as much as possible and the [illegible] left up for at least six hours; also all dressing utensils were [illegible] 2 per cent. formalin solution. The ordinary lamp supplied for [illegible] the vapour was found to be unsatisfactory in some respects [illegible] dangerous. The [illegible] means of regulating the flame, and [illegible] with the vapour. Often catching fire causing a large flame. The [illegible] required to fumigate thousands of cubic feet of space and [illegible] required. It was found that the ordinary brass [illegible] of stoves is solder, the difficulty. These [illegible] on the top which exactly fitted the round tin [illegible] supplied. Also there is means of regulating [illegible] vapour is given off slowly and continuously. It was found [illegible] possible to make such large spaces absolutely air-[illegible] over all it is a clean fumigant and is fairly [illegible] ship's company were made to come to the sick [illegible] mouth washes of 1 per cent. formalin [illegible] 2 per cent. oral infection. As regards spraying with [illegible] 2 per cent. solution was used. At first great difficulty was [illegible] a suitable spray; finally the following one was found to [illegible] it was made on board for me by the engine room staff. It consists

[illegible] copper pipe, [illegible] containing 4 per [illegible] cted to the flex [illegible] mouth of the [illegible] to be quite sufficient [illegible] p the liquid and [illegible] readily be understood how suitable this [illegible] all the cooks and stewards which also [illegible] and quite easy to spray all the mess decks [illegible] ty of four men When the epidemic was at its height [illegible] as de [illegible] a week

Surgeon T C HUNOT describes an improvised Irrigator Apparatus which he used for subcutaneous administration of normal saline during an outbreak of enteritis on board in the Mediterranean —

I improvised an apparatus for the subcutaneous administration of normal saline solution whereby several pints of fluid could be given to a patient daily with the minimum of discomfort The can and rubber tub



employed were the usual irrigating apparatus A two way glass [illegible] was improvised from the irrigating nozzle supplied by cutting the [illegible] tubing near its bifurcation and breaking down the inner septum [illegible]

possible The apparatus was completed by the use of two pieces of [illegible] stethoscope tubing and two needles supplied for the "glaseptic" syringe. From 3 to 4 pints daily of normal saline solution (temperature 110° F. in the can) were administered into the subcutaneous tissue of the axilla slowly in several cases and were absorbed very readily They occasioned the patients very little and led in a very striking manner to the immediate cessation of the vomiting marked improvement of the pulse and to a very early disappearance of blood and mucus in the stools

I suggest that a proper apparatus for the administration of subcutaneous saline solution be supplied to ships This method has the advantage of not inconvenencing the most seriously ill case to any extent and can be repeated daily and as often as necessary The intravenous method I apparatus for which is supplied disturbs the patient considerably and is daily repetition is not possible owing to the limited number of suitable veins accessible, while septic infections with this method are more serious and more likely to occur than in the subcutaneous method Rectal infusions of fluid are in my opinion not retained by this class of patient

Surgeon G. M. GRAHAM suggests the addition of a Hinged Flap to the Operating Table on board —

The operating table stands in the centre of the operation room and is fixed to the floor by its legs being screwed into little metal clips It is of white metal and has a movable head piece and a movable flap at the foot Chancing one day to be giving an anæsthetic in our operation room I found myself in rather a dilemma Both the lotion tables were in use The dressing table was covered with the instruments The patient's head was supported on a pillow and the rest of the table smothered in blankets I had both my hands full and when I wished to use the gag or the tongue forceps I had to put the mask and the bottle on the deck, and this set me thinking that it might be a good thing to have a small attachment to the operating table for the anæsthetist's benefit I think the best locus for it to take would be a hinged flap, attached to the head piece, with little clips on the outer side to hold the bottle and forceps and gag and, perhaps, a hypodermic syringe It might be fixed at right angles, but if it were hinged and supported on a notched semicircle, it could be brought up to a level with the rest of the table and so give an extra breadth of space if that were necessary—thus serving a double purpose

Reviews.

[illegible] Bacteriology Blood Work [illegible] Parasitology including Bacteriological Keys Zoological Tables and Explanatory Clinical Notes By L. [illegible] Ruge M.D., Medical Director U.S. Navy Graduate [illegible] School of Tropical Medicine Head of Department of Tropical Medicine U.S. Naval Medical School Professor in Tropical Medicine Georgetown University Professor of Tropical Medicine George Washington University Lecturer in Tropical Medicine Johnson Medical School Member National Board of Medical Examiners Member Health Board Hygiene Laboratory [illegible] Associate Professor of Medical Zoology University of [illegible] Fourth edition revised and enlarged Philadelphia [illegible] 1916 [illegible] 800 With [illegible] illustrations cloth [illegible] Price 9s net

The publication of a fourth edition of this excellent book is a proof of a little over two years after its [illegible] the third shows how greatly the work has been appreciated [illegible] the volume of knowledge in the subjects treated of [illegible] systematic consistent increase in the laboratories [illegible] that is proof to a pocket handbook the use of [illegible] small practitioner has been largely employed and to facilitate [illegible] has been introduced The whole has [illegible] revised and some of the sections have been entirely rewritten [illegible] chapter about diseases of unknown or doubtful etiology has been added dealing with the virus theory of human pellagra [illegible] fever rat bite fever [illegible]

The book is divided into Part I bacteriology which occupies 196 pages Part II study of the blood Part III animal parasitology Part IV clinical bacteriology and animal parasitology of the various body fluids and organs and an appendix giving methods of preparation of tissues mounting parasites and clinical examinations of blood &c The whole book from cover to cover is full of most useful information and deals with an extraordinarily wide field so that especially for those employed in tropical and sub tropical regions it contains details sufficient to make almost any examination for the purpose of coming to a satisfactory diagnosis The greatest charm of the book is its eminently practical character, not merely a laboratory manual but a link between clinical medicine and pure laboratory study The illustrations are excellently selected and generally very clear and they add greatly to the value of the work The use of keys at the commencement of each section will be found a great aid to the determination of each group

In certain parts particularly in that dealing with the technique of the Wassermann tests the use of fractions instead of decimals is rather a disadvantage

There are of course a number of facts stated which are still debatable as to correctness but these are few for instance the old error is made of calling the bacillus of malignant œdema Gram negative

[illegible] confidently recommended to [illegible] naval and [illegible] part of his equipment and [illegible] will be found [illegible] being compiled by one who has [illegible] useful for medical officers in the owe navy

F W B S

[illegible] PATHOLOGY FOR PRACTITIONERS By [illegible] M D, B Sc Lond Director of the Laboratories [illegible] on Pathology and Bacteriology King's College [illegible] Lecturer on General Pathology London School of [illegible] Women formerly Huntarian Professor Royal College [illegible] Edinburgh London H K Lewis and Co Ltd [illegible] 8 — 110 With 11 plates and [illegible] illustrations [illegible]

[illegible] this edition of this book shows how great is the [illegible] work It maintains the high degree of excellence [illegible] has had to be considerably enlarged to meet [illegible] It is essentially as was originally issued by the [illegible] book for practitioners with some opportunities of [illegible] diagnosing their own cases

To the [illegible] diagnostic methods of determining which of the typhoid [illegible] case belongs the method of Dreyer [illegible] the section on syphilis Melntosh and Fibles [illegible] Wassermann reaction is given in extenso though the [illegible] has only a method is still preferable

The [illegible] section is perhaps the most excellent portion of the book [illegible] and great experience of the author is [illegible] It states that for general purposes the estimation [illegible] than the more laborious count [illegible] reference to the use of Holdines [illegible] best on the market gives the useful [illegible] potable water through which gas has been kept for three or four days in a tightly stoppered [illegible] this is a practical point of importance in the Navy [illegible] mations have frequently to be made

In the technique for making serum for typhoid agglutination the words such as [illegible] column of typhoid cultures would preferably be changed to [illegible] page 195 on taking blood from the vein, suction by the mouth is only to be recommended

The growth of colonies of the meningococcus on agar is stated to be similar but slightly larger than those on blood serum which is contrary to the experience of the workers Also it would be unwise to look upon the presence of a Gram negative motile bacillus from a blood culture obtained from a case clinically resembling typhoid as necessarily Eberth's bacillus though it may be right to regard and treat the patient as an early typhoid until further [illegible] is possible

With these few criticisms which do not detract from the usefulness of the whole one can strongly recommend the book to those who are active practitioners and it should be most helpful to naval medical officers The book is well printed the illustrations generally good and its size is most convenient

F W B S

[illegible] M.D. F.R.C.P.S.G., Physician to the Royal Infirmary, Lecturer on Medicine in the University of Glasgow. [illegible] Edinburgh: E. and S. Livingston. 1916. Pp. [illegible]. Price [illegible].

The little book combines the main features of pathology and morbid anatomy with those of symptomatology. Written in concise and lucid style the subject matter is condensed into a small space as possible. The essential points are always kept in view so that the reader's train of thought is not hampered by the inclusion of minutiæ in his study.

The chapters dealing with disorders of the cardiac rhythm and heart block form a convenient introduction to the interpretation of Mackenzie's whose polygraph is illustrated. The handling of nervous diseases after a review of the anatomy and physiology of the nervous system, leaves a clear cut impression on the mind, instead of the hazy recollections usually associated with this puzzling theme.

From the point of view of the student preparing for a final examination, greater stress might be laid on the sophisms in connection with the various tests employed in the examination of urine. Long ago Thomas Fuller pertinently observed that "reasons drink from the urine urs as little as the urinal," a point which is not infrequently lost sight of to day.

The assimilation of an immense number of hard facts will always remain a difficult problem to solve. Those who look a very retentive memory will find in this handbook a convenient means of reference while any one desiring to read up their general medicine within a short period of time might make use of it with advantage.

AN INTRODUCTION TO DERMATOLOGY. By NORMAN WALKER, M.D., F.R.C.P., Physician with the assistance of R. Cranston Low, M.B., F.R.C.P., Assistant Physician for Diseases of the Skin, Royal Infirmary, Edinburgh. Sixth Edition. Edinburgh and London: William Green and Son, Ltd. 1916. Pp. xiii + 363. With 64 coloured plates and 89 illustrations. Price 16s. net.

This edition of a popular work marks a notable advance on its predecessors by the inclusion of a small atlas comprising sixty three coloured plates. These are extraordinarily true to life and form an admirable supplement to the written matter. In dermatological work a striking illustration is frequently of material assistance towards a correct diagnosis and it is difficult to imagine more helpful examples than these plates which are photographed from casts by the three colour method.

The whole of the text has been revised and much rewritten, while new sections on pellagra, sporotrichosis and regional dermatitis have been added. The last named condition replaces eczema a term sanctioned only by age and tradition and which too often served to cloak the ignorance of the observer, leaving the diagnosis obscure. As the author points out: "By using the word dermatitis (without any adjective) we admit our ignorance, and constantly remind ourselves of the necessity for searching out the causes of the inflammation." Such a straightforward attempt to place the diagnosis and treatment of "eczema" on a solid

scientific [illegible] will be welcomed by all and [illegible] will [illegible] appreciate how far the tangled skein surrounding the origin of this disease has been unravelled The paragraphs dealing with dermatitis venenata and occupation dermatitis appear most instructive in this connection

The commoner diseases receive their full measure of delineation while the rarer ones (of interest chiefly to the specialist) are alluded to briefly The chapters on "lichen planus psoriasis and syphilis are of especial interest to the Naval medical officer Definite lines of treatment are laid down, where possible, for each disease—a distinct advantage to the inquirer while the actual worth of the later methods (such as radium, carbon dioxide snow, actinotherapy and vaccines) is estimated carefully before allotting them their respective spheres of influence The preparation of ointments, pastes, powders and poultices together with an account of simple diagnostic bacteriological methods, form a useful adjuvant

The tone of the whole book is eminently readable and instructive, chiefly owing to the simple and easy style Interest in the various conditions is stimulated by the original but always reasonable views of the author

To any one desiring a sound and practical introduction to dermatology, replete with common sense, we can recommend this volume without hesitation

THE ORGANS OF INTERNAL SECRETION By Ivo Geikie Cobb, M D, M R C S late Assistant to Out patient Physician Middlesex Hospital London Baillière, Tindall and Cox. 1917 Pp 228 Price 5s net

The author explains that this small book was written with the object of laying before the busy general practitioner the important points in the whole question of ductless glands and their secretions without rendering an exhaustive and complete account of these organs, a study of which would require more time than his readers have at their disposal The first chapter deals briefly with the histology and physiology of the thyroid and parathyroid glands and gives a short account of the functions which have been attributed to these bodies In Chapter II we have a most interesting essay on Graves disease Stress is laid on the fact that in persons who exhibit signs of thyroid instability a mental strain or sudden anxiety is capable of precipitating the disease in this connection it may be said that the present War must have operated on thousands of such men without producing this effect Thyroid deficiency occupies Chapters III and IV then follows a description of the structure and functions of the pituitary body and the effects produced by morbid conditions of this organ together with their treatment The adrenal glands is the subject of Chapter VI Chapter VII deals with the pancreas and Chapter VIII with the internal secretions of the sexual organs

In Chapter X the subject of the therapeutic application of hormones has been epitomized Chapter XI is a summary of the present position of hormone therapy The author writes concerning a somewhat obscure branch of medicine in a thoroughly interesting manner, and there is no doubt that his work will be of the greatest help to all general practitioners

SANITATION IN WAR By Major P S Leican C B, I R C S, D P H R A M C Assistant Professor of Hygiene, Royal Army Medical College Second Edition London J and A Churchill 1917 Pp 326 With 54 illustrations Price 6s net

The first edition of this little book was published in 1915, and the present edition is enlarged by 68 additional pages and 15 fresh illustrations The original matter has been brought up to date, and new material has been added by expanding the chapter on field conservancy to include references to various methods which have been evolved during the present War The chapter also on The Role of Insects in War contains much that is new

We wish the author had given us a solution of the problem of the ultimate disposal of sullage the grease of which has been removed, where there is a continuous layer of clay soil We are simply told that the sullage cannot be absorbed—and the site is so damp and cold that it is not suitable for camping on , but needs must when the devil drives and however damp and cold such sites may be, military exigencies often compel us to accept them and to dispose of sullage on them

This book will be invaluable to medical officers in the field

A TEXT BOOK OF PUBLIC HEALTH (Late Husband's) By E W Hope, M D, D Sc Professor of Public Health, University of Liverpool Examiner in the Universities of Belfast Edinburgh and Manchester Eighth Edition Revised and enlarged Edinburgh E and S Livingstone 1915 Pp 267 With 54 illustrations Price 5s net

When a book rapidly reaches its eighth edition this fact alone testifies to its popularity and value. It must be stated at once that the object of the work is to meet the requirements of the medical student or the practitioner reading for the Diploma in Public Health, and therefore the author has covered essential parts relating to the subject in as simple and useful a manner as possible, so that he who masters the contents may be in a position to answer any questions at the examination satisfactorily, but it naturally follows that many of the questions a medical officer of health has to decide cannot be fully and completely dealt with in a text book designed to prepare a candidate for examination For instance the author enumerates many methods in vogue of disposal of sewage but there is little or no discussion of their respective merits or of the indications for their particular application To those who desire to acquire sufficient knowledge of the whole subject of public health to enable them to obtain the D P H this book can be recommended as being concise and sufficient

BACK INJURIES AND THEIR SIGNIFICANCE UNDER THE WORKMEN'S COMPENSATION AND OTHER ACTS By Archibald McKendrick F R C S E, &c , Surgeon in Charge of Surgical X ray Department, Royal Infirmary Edinburgh Edinburgh E and S Livingstone 1916 Pp viii + 173 With 13 illustrations Price 2s 6d net

The author rightly remarks that back injuries have a bad reputation from the point of view of the medical examiner, the workman the lawyer and the Court The medical examiner often is faced with the difficulty of estimating the true value of subjective symptoms in the comparative

absence of physical signs and the lawyer is puzzled by conflicting reports and by the lack of authoritative opinion in medical literature This little book has been written as an attempt to throw some light into the existing darkness and to suggest some practical methods of testing the genuineness or otherwise of the complaints made

The opening chapters deal with the structure of the spinal column in relation to the bone, the tissue and the muscles and later the symptoms signs diagnosis and methods of examination of back injuries are discussed including X ray examination We are advised to beware of the fifth lumbar vertebra " in X ray examination, this vertebra owing to its distance from the plate and shape does not cast a definite shadow while it has two epiphyses for the lamina which frequently in the adult remain ununited and give rise to a line closely simulating a fracture A false interpretation of such a plate would cause the medical examiner great trouble in Court The work concludes with an appendix containing a summary of the signs in spinal injuries and an account of the superficial and deep reflexes, well adapted for rapid reference

The author has made a special and close study of the subject as a whole and gives us many practical and valuable hints When forming an opinion on a doubtful case of back injury the book will be found extremely useful

EXTRA OCULAR PRESSURE AND MYOPIA By Islay B Murchead M D London John Bale, Sons, and Danielsson Ltd 1916 Pp viii + 96 Price 3s 6d net

This booklet consisting of ninety six crown octavo pages printed in twelve point modernal type, double leaded, or wide interlineas and interverbal spacing, is very comfortable for one's own eyesight in the reading

It cannot be said that the author sheds any new light upon the pathogeny progress or treatment of myopia The type of myopia with which he deals is that ordinarily met with wherein occurs anterio posterior elongation of the eyeballs and co distortion is drawn between (1) the low, non-progressive myopia and that other ellipical form (2) progressive myopia with fundus changes and consequent degeneration Myopia due to (3) congenital defect (4) faulty cornea, (5) faulty lens does not come within the author's purview

The orthodox views of myopia connote three factors —

(1) Etiological malnutrition, fatigue faulty illumination, and eye strain

(2) Innate tendency of the *sclera in myopia* to yield to the resultant of intra and extra ocular pressure

(3) Excessive pull of the internal rectus muscles, due to excessive and prolonged convergence, in order to visualize near objects resulting in elongation of the eyeballs, in the direction of least resistance, viz, posteriorly

The author considers that the resultant action of the recti muscles is to cause the globe to bulge inwards basing his argument on the tonicity of these muscles and the variations in apparent size of objects with varying refraction and number of retinal elements stimulated

One must concede that the majority of people exposed to the etiological factors above mentioned do not acquire myopia, and Cohn's statements,

[illegible] and residential [illegible] will be overfatigued

[illegible] is laid upon the fact that [illegible] myopia in generations following [illegible] consanguineous [illegible] related myopes would be [illegible] mind [illegible] of Johann Gregor Mendel [illegible] so exactly [illegible] Dominants Recessives [illegible]

The [illegible] tells us that he is a low [illegible] under [illegible] of myopia In one [illegible] comfort [illegible] full correction is worn and [illegible] over) corrected only with a slight deduction [illegible] patient [illegible] of studious habit Hereupon [illegible] comfort of the patient is important and [illegible] rarely than one has to revise *the full correction* The Navy [illegible] to day is to deal with myopia and in astigmatism both [illegible] in non executive ratings, and in some signal ratings and other [illegible] men who may be stopped from drill and be found on examination to be for shore service if required with glasses In these cases full correction of [illegible] with suitable interocular setting and [illegible] is ordered, and the man is re examined periodically to watch the visual acuity and fundus oculi Sir William Crookes (No I) tinted glass is useful in relief of glare and asthenopia states

This thoughtful little book by Dr Muirhead recalls for us all our ignorance of the pathogeny of myopia, the need to secure better hygiene of the eyes and so avoid defects that come in the train of strain glare faults of and misdirection of, illumination

THE NATION'S HEALTH THE STAMPING OUT OF VENEREAL DISEASE By Sir Malcolm Morris K C V O Member of the Royal Commission on Venereal Diseases and of the National Council for Combating Venereal Diseases 1917 London Cassell and Company Ltd Pp 102 Price 3s 6d net

A time has arrived when the whole subject of venereal diseases is no longer kept in the dark but is openly discussed in the daily papers It is of the utmost importance that the people should be educated on the subject, and especially that the education be carried out by competent authorities in a proper manner This book written by an eminent medical man aims at giving such an education The preface states that it is intended primarily for the use of lay members of administrative bodies but its contents suggest that it goes further than this, for a perusal would equip the medical man with a knowledge of a hitherto neglected subject which would be of value to him in replying to the various questions on venereal diseases which are daily asked by the non medical world To the Naval medical officer it is of value in supplying facts and material which would help him in giving health lectures

The book is well printed and written with a clearness of style which will commend itself to any educated reader The contents present the chief points of the evidence given before the Royal Commission on venereal diseases and several questions in connection with the evidence are discussed The first part of the book details the various forms in which syphilis affects the body, giving statistics which cannot fail to

[illegible] the health of the nation A short history of [illegible] steps that have succeeded in placing the dis[illegible] present footing are detailed It is noted that the [illegible] the stages of syphilis made to the three classical [illegible] stage which would embrace the so called para syphilitic lesions The adoption of this term would have its value in that it would bring all the syphilitic lesions into their proper place in statistical returns

Under the heading, 'Spreading the Light the diffusion of knowledge in venereal disease is dealt with and it is gratifying to the Naval Medical Service to find that the methods advocated have been practised in the Navy for the last five years

The aims and objects of the National Council for Combating Venereal Disease are given A chapter is devoted to the present inadequate facilities for diagnosis and treatment, and the outline of the scheme advocated by the Royal Commission is given The question of compulsory notification and treatment is discussed In regard to the regulation of venereal disease by Acts of Parliament, the advantages and disadvantages of the Contagious Diseases Act are discussed as regards results both in England and abroad The policy of regulation is outlined in a clear manner, and careful reading will go far to enlighten the misunderstandings with which the supposed benefits to be derived from the Contagious Diseases Act are surrounded The question of quack treatment is dealt with, and attention is drawn to the evidence given by a herbalist before the Royal Commission which should be read

The book concludes with a chapter pleading the urgency for taking immediate steps to deal with these important diseases The volume is written by a specialist for a high moral purpose and is to be recommended to both lay and medical men who desire to obtain a working knowledge of venereal disease

Abstracts.

Riggs (C. [illegible]) [illegible] Venereal Dis[illegible] Naval Training Station [illegible] United States [illegible] Washington 1917, vol [illegible] No. [illegible] pp. 1-15

While inst[illegible] measures to prevent venereal disease at the Naval Training Sta[illegible] Norfolk Va., records concerning each fresh admission were kept during a period of twenty months (from March 1, 1915 to October 31, 1916) very useful information being obtained particularly with regard to [illegible] prophylaxis. The number of men borne was 2,053, the ages of recruits were from 18 to 26 and 360 fresh cases of venereal disease occurred during the period. Any fact thought to have exerted influence on infection was recorded such as whether under the influence of alcohol whether contracted prior to enlistment on short leave or on long leave. The prostitutes were classified as inmates, street walkers or clandestines. It was noted also, whether artificial prophylaxis had been used and, if so how many hours subsequent to exposure. If two diseases were present in one individual only the more serious disease was counted; for instance if a double infection of gonorrhoea and chancroid, the disease was counted as gonorrhoea or if of syphilis and gonorrhoea it was classed as syphilis.

A summary of this kind of information for the twenty months is given in the following table:—

TABLE 1.—VARIOUS CIRCUMSTANCES CONCERNING 360 VENEREAL INFECTIONS

[illegible]	[illegible]	[illegible]
Number infected	[illegible]	[illegible]
Contracted prior to enlistment	3	[illegible]
Contracted while on furlough	7	86
Contracted while on leave	15	112
Under the influence of alcohol	12	105
Not under the influence of alcohol	15	[illegible]
Used artificial prophylaxis	8	61
Did not use artificial prophylaxis	12	118
Contracted in Norfolk or vicinity	12	114
Not contracted in vicinity of Norfolk	1	153
Contracted from inmates	1	112
Contracted from streetwalkers	12	160
Contracted from clandestine	4	93

The artificial prophylactic treatment at the station was by calomel ointment (about 33 per cent.) or by an injection of a silver salt. Records of 3,556 such treatments were kept including the number of the hour subsequent to exposure during which the treatment was taken. Table III shows that treatment during the first hour is very effective but that there is a fairly uniform increase of disease from the second to the eleventh hour and over, the treatments lose greatly in efficiency somewhere between the fifth and the eighth hour. The total number of diseases prevented is 169.3, no less than 81.5 being credited to the first and second hours. The figure, 5.66 the percentage for eleven hours and over, is an indication of the average rate of infection of venereal disease as it can be assumed that prophylaxis then can have little effect.

TABLE [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	1	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	1	[illegible]	[illegible]
Total	3 [illegible]	6[illegible]		[illegible]

Lectures on educational prophylaxis were inaug[illegible] March 1915. [illegible] contrary to expectation the number of artificial [illegible] treatments diminished —

TABLE VIII.—NUMBERS AND PERCENTAGES OF THOSE [illegible] A PERIOD OF FIVE MONTHS PRIOR TO LECTURES A[illegible] PERIOD OF FIVE MONTHS EACH (APPRENTICE SEAMEN [illegible])

	Average complement	[illegible]	[illegible]
First five months	794	1 09	[illegible]
Second five months	783	1	[illegible]
Third five months	618	09	[illegible]
Fourth five months	798		[illegible]
Fifth five months	168	1.08	[illegible]

TABLE IX.—PROPHYLACTIC TREATMENTS FOR TEN MO[illegible] THE HOUR TAKEN SUBSEQUENT TO [illegible]

NUMBER OF HOURS AFTER [illegible]

	1	2	3	4	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1		27	5	8	23	22	33	[illegible]		1	[illegible]
[illegible]	3	0	[illegible]	15	13	15	7	11	[illegible]		1	[illegible]
[illegible]	1			15	16	27	13	43	9			[illegible]
[illegible]		11	17	6	9	14	17	31	50		17	184
[illegible]	1	6		9	11	14	18	23	33			120
[illegible]	1	13	11	23	9	11	11	11	1	1	1	182
[illegible]	6	3	35		11	9	1	1	2	1	1	240
[illegible]		79	8	11	4	1	1	9	1			248
[illegible]	1	4	28	13	14	6	2	8		1	1	210
[illegible]		71	13	1	5	1	2				4	10
[illegible]	[illegible]	[illegible]	111	[illegible]	122	105	16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		1		1	3	1	2	6		5	4	[illegible]
[illegible]	—	0.1	0 [illegible]	70	1.15	2.3	1.6[illegible]	1.61	.00	[illegible]	[illegible]	1.41

O[illegible] educational lecture [illegible] render the artificial prophylaxis [illegible] cient by diminishing the period of time of taking it subsequent to exposure (See Table IX)

The following table giving the source [illegible] tion with the number and percentage of each disease, is of interest —

TABLE XII —CONTRASTING SOURCE FROM WHICH [illegible] ARE CONTRACTED AND NUMBER AND PERCENTAGE OF [illegible] DISEASE

	Number of Infections	Gonorrhea		[illegible]		Syphilis	
		Number	Percentage	[illegible]	[illegible]	Number	Percentage
Inmates	181	33	17 [illegible]	[illegible]	[illegible]	12	6 5
Streetwalkers	138	21	1 [illegible]	[illegible]	[illegible]	12	11
Chambermaids	42	4	13	[illegible]	81	3	1 1

The author concludes that education is the most important factor Educational prophylaxis should be from several points of view and should be supplemented by artificial prophylaxis The latter to be effective should be administered during the first or second hour after exposure The propaganda for the prevention of venereal disease and for alcoholic temperance may well go hand in hand In the service hygienic instruction should be repeated at suitable intervals as otherwise the good impression made by the lectures will be largely forgotten

W L M

THE NAVY'S HOSPITAL SHIP *The Military Surgeon* Washington, 1917, vol xl, No 1 pp 76 77 (Editorial)

In accordance with the provision of the Naval Appropriation Bill approved August 29 1916 the Navy will have a hospital ship Congress appropriated $2 500 000 for this purpose and specified that the work should be begun as soon as practicable Preparations are now under way to build this ship at the Navy Yard Philadelphia Pa It will be the first ever built solely for hospital purposes and represents a new field in naval architecture The Bureau of Medicine and Surgery Navy Department has long advocated a ship of this class and its recommendations have been endorsed by the General Board The usefulness of hospital ships has been amply proven by the present war in Europe and their necessity in our Navy was the subject of an editorial in the May number of this Journal as well as on other occasions Surgeon General Braisted of the Navy, in a strong helper in the value of a hospital ship as a constituent part of our fleet, based his report on the Japanese naval medical and sanitary features of the Russo Japanese War bears tribute to the interest he has always felt in this subject The new ship not only will include all the features of our largest and best equipped naval hospitals but also provisions for an out patient department where persons may receive special examinations or treatment not to be obtained aboard the ordinary ships of the Fleet and which will greatly enhance her value

She will be [illegible] cleaner and free from all the dust and dirt which result from coal consumption and the discomforts connected with taking coal aboard, which the ordinary traveller of the sea does not experience. In order to make the ship as steady as possible she will be fitted with stabilizers, a gyroscopic contrivance designed to reduce the roll and pitch to a minimum. The hospital department will be of a most complete character and every effort is being made to include in this design the best modern and up to date systems of lighting, heating and ventilation. Her main operation room will be a large space extending the height of two decks and provided with ample natural illumination. Her out-patient department will contain dental operating room and dental laboratory, X ray and X ray study rooms, eye ear throat and nose rooms with adjacent small operating rooms and treatment booths, and a most complete chemical and biological laboratory equipment. In addition to her wards with quiet rooms adjacent thereto and other necessary rooms such as linen rooms, toilets, wash rooms, pantries &c., she will have small operating rooms, dressing rooms, a hydro therapeutic department, a thermo therapeutic department, endoscopic room and a special acute treatment room in connexion with the venereal ward. The contagious disease department is so designed as to be effectively separated from the rest of the activities of the ship and to have the latest fixtures of disinfection and control communication. There is every indication that the ship when completed will represent the most modern ideas of hospital arrangement and construction so far as such may be adapted to a ship and meet the structural requirements, and the necessity of compartment division below the water line. The Surgeon General and Medical Corps of the Navy are to be congratulated upon the fruition of their efforts to obtain this addition to the efficiency of the fleet so long hoped for by naval medical officers. W. L. M.

Orbaan. Le Réaménagement des Navires hôpitaux. *Arch. méd. et pharmacol. navale*, Paris, 1915, tome cxv, pp. 355-366, 418-430.

These archives, the issue of which was suspended in August, 1914, until September, 1916, now contain an article, based on eighteen months experience of work in a hospital ship dealing with their use in conveying patients from one French port to another, in transporting patients from distant expeditions, and in providing hospital treatment. Five hospital ships have been employed in evacuating wounded from parts of the fighting line in the North of France, and it is interesting to note that in these cases bear the pitching and rolling caused by bad weather less than the vibrations of trains. During the Gallipoli campaign hospital ships served as a fixed ambulance for the severely wounded, providing early and urgent surgical treatment, for the reception and [illegible] of other wounded for a temporary resting place for officers from the front and for the transport to Algiers or France of patients [illegible] to return after a short time to the fighting line. After the evacuation at Cape Helles there was sufficient hospital accommodation [illegible] and the hospital ships were used merely to evacuate patients from that port. From the experience gained during the present war the following recommendations were made. Hospital ships should be specially constructed in peace time so as to meet the various calls that may be

made on them by continental colonial or sea warfare They should be at least 10,000 tons capable of carrying 600 patients and of steaming not less than 15 knots and free from tendency to roll and pitch The wards should each contain 100 or more cots arranged in the long axis of the ship, separated from each other, and not superimposed The principal ward for the severely wounded should be provided with two operating theatres and their annexes and an *x* ray room The wards should be well lighted naturally or artificially provided with steam heating, and protected by the structural arrangements of the ship against the heat of the Tropics The passages and doors should be wide so as to allow the easy transport of stretchers The attendants should be in the proportion of one to every ten patients After each voyage the ship should be disinfected H D R

McDowell (R W) Diseases incident to Submarine Duty *United States Naval Med Bull* Washington 1917 vol xi pp 11 50

The Diesel of submarines in the United States Navy use gasolene engines for running on the surface and poisoning may be due to inhalation of the fumes of raw unburnt gasolene or of burnt gasolene The inhaled fumes of unburnt gasolene due to leaks in the pipe lines cause symptoms resembling those of alcoholic excitement Fumes of burnt gasolene may escape into the submarine from a leaking valve or more frequently when the batteries are being charged Further a stern wind may blow the exhaust from the engines directly on to the bridge or down a hatch or it may be drawn down a ventilator or fumes may be drawn into one submarine from another alongside charging its batteries The products of a gasoline engine are methane, acetylene, and carbon monoxide Poisoning from inhalation of the fumes of burnt gasolene are more frequent and serious than in the former case. The symptoms vary, according to the amount of the fumes and the time they are inhaled from headache, which the engine room man almost always have when the submarine is running on the surface to delirium and coma with grave constitutional manifestations In all cases the blood pressure is high The patients should be taken into the fresh air and if conscious and able to swallow given a teaspoonful of sal volatile in collapse and coma hypodermic stimulation and artificial respiration should be employed

Tinnitus and varying degrees of deafness are due to changes in the atmospheric pressure and to working for long periods close to the noisy engines Irritating gases from the engines and batteries cause inflammatory affections of the respiratory passages and conjunctivitis which is also induced by prolonged straining at the periscope Sea sickness is not uncommon and is not considered to be so disgraceful as on a battleship nostalgia and neurasthenia are occasionally seen and the author refers to two cases of claustrophobia H D R

Netter (A) Les formes purpuriques de la méningite cérébrospinale (Nécessité de l emploi de sérums antiméningococcique polyvalents) *Presse de Médecine*, Paris 1917 tome xxiv, pp 133 150

Purpura in cerebrospinal fever is not so frequent in Netter s experience as herpes labialis which was seen in one third of his cases It usually is ordinary purpura but in the early stages it may resemble the rose spots

of cutaneous [illegible] transform the [illegible] bulla and in the [illegible] gonococcus [illegible] case of purpuric [illegible] with [illegible] which a colored [illegible] instance [illegible] usual hemorrhagic [illegible] meningococcic purpura. Meningococcemia with purpura [illegible] fairly more frequent during the last two [illegible] and Germany it may occur without [illegible] shown by lumbar puncture, and in such cases the diagnosis [illegible] difficult but can be made by blood culture and examination of the skin lesions. In meningococcic purpura there is polymorphonuclear infiltration around the embolisms arterioles, in typhus, lymphocytic infiltration around thrombosed arterioles, and in the rose spots of enteric fever the lymphatics in the papillæ of the dermis contain typhoid bacilli. Meningococcic purpura is prone to be associated with suppurative arthritis, endocarditis and malignant endocarditis. As is well known, in some cases of meningococcic purpura without meningeal symptoms the cerebrospinal fluid is clear and contains meningococci, and meningitis follows. While the prognosis of meningitis with purpura is usually considered grave, early injection of multivalent antimeningitis serum is recommended. Intravenous injection although more effective is dangerous and is not considered necessary. Intrathecal injection has been found to be successful. H. D. R.

Ewing (S.) and Moss (H. L.). Chemical versus Serum Treatment of Epidemic Meningitis. *Journ. Exper. Med.* Baltimore 1916, vol. xxiii, pp. 683-701.

Intrathecal injection of lysol (1 per cent. solution) was employed in 1908 in Lisbon, and in 1904 in New York, where it was abandoned when the serum treatment was evolved. In 1910 Wolff similarly used protargol in eight cases with five recoveries, basing this method of treatment on the success of so-called colloidal silver in gonorrhœa, and on the influence of the cultural features, survival, and reaction to antiseptics existing between gonococci and meningococci. Another *a priori* consideration in favour of antiseptic injection is that as the different strains of meningococci are acted upon only by their corresponding anti-serums, [illegible] being less specific would be too restricted in their effects and might be expected to act quite irrespective of the strain of infecting meningococcus. As meningococcic infection in man varies greatly—from the abortive to the fulminating form—experiments on young guinea-pigs and monkeys were undertaken to throw light on the therapeutic action of protargol, lysol and anti-meningococcic serum. Virulent cultures of meningococci were injected into the peritoneal cavity of guinea-pigs and into the subarachnoid space of monkeys. Protargol in 0·2 per cent. suspension—the strength employed by Wolff—when injected with the culture directly after mixing, or at fifteen minutes interval was incapable of preventing a fatal result in guinea-pigs from a single minimal lethal dose of meningococci. Although they exert a bactericidal action on meningococci neither protargol nor lysol have any curative effect on experimental meningococcic infections; they interfere with and diminish migration of leucocytes and phagocytosis, and do not possess any anti

[illegible] this centurely by [illegible] by agglutinating [illegible] before the logical [illegible] and protargol reduces [illegible] phagocytic effect of [illegible] set aside entirely than [illegible] results

H D R

Bourne (H), Meningitis [illegible] Staphylococques [illegible] *Ann d'hy méd et pharm* [illegible] pp 918 933

Very few cases are recorded [illegible] this left to *Staphylococcus albus* This case was also [illegible] complete absence of any other infective focus in its long [illegible] which presented itself after a remission of symptoms for [illegible] weeks, in full recovery The [illegible] high fever (102° to 104° F) of long duration, and convalescence was interrupted by neuralgia of the lumbosacral plexus and mental disturbance A comparison with meningococcic meningitis which it resembled in many respects and differed from in others is instituted The cure of the primary attack was ascribed to the artificial production of no abscess (Bocher's method), which contained the same staphylococcus as the cerebrospinal fluid and thus provided antibodies The author emphasizes the value of this form of treatment Lumbar puncture was performed five times, and on the first occasion antimeningococcic serum was given Intravenous injections of electrargol were given, but were disappointing

H D R

Harnett (W L) Sandfly Fever and Dengue *Indian Med Gaz*, 1916 December vol li No 12, pp 444 452 with 33 charts

In parts of India where dengue and sandfly fever are very prevalent, difficulty in diagnosis has frequently occurred, sandfly fever often being termed three day fever, and dengue seven day fever long attacks of the one and short febrile periods to the other give rise to intermediate forms, also the saddle back curve or secondary rise is not confined to one alone

In this paper a number of temperature charts of the two forms are given to illustrate their characters

In 1913 the author published a short paper on the changes which are noticed in differential blood counts made at various periods in cases of dengue These were confirmed recently by a further series they showed an early leucopenia with rapid diminution of the polymorphs, an increase in the number of lymphocytes and a rise in the eosinophiles A combined chart of fifty cases shows the polymorphs and lymphocyte curves crossing about the sixth day Balfour had previously noted that the eosinophiles were increased during convalescence this was practically always present in the author's cases (up to 10 per cent) and was not dependent on intestinal parasites, at least no ova were found From his extended observations and the experience of others the author is unable to fix on any points of differentiation between the two diseases whereas the similarities of the pyrexial curves of many cases in epidemics of each of the fevers with the identical characters brought out by blood examination and relative white cell counts cause him to conclude "*that they are not two closely related fevers, but one and the same fever, modified by circum*

stances as yet unknown He suggests that sandfly fever is the ordinary endemic type with a percentage (15 to 20) of severer forms, that when occurring in epidemics the disease would be to hand the cases of the more severe form, lasting five or six days, and accompanied by a terminal rash viz., dengue

Whether an acquired immunity for sandfly fever will protect a person from dengue in the presence of a severe epidemic has not been worked out, and observations on these lines would be interesting. Etiologically both diseases are due to filterable viruses, the one spread by mosquitoes the other by sandflies but the incubative periods are different It is possible that more than one kind of vector may be able to convey these diseases

SARRAILLE (A.) Dengue and fièvre de trois jours *Bull Soc Path Exot*, 1916, December, vol ix, No 10 pp 778-794, with eight charts

The author during the Dardanelles campaign in 1915 and in western Macedonia in 1916 observed epidemics of a short fever which was difficult to differentiate from sandfly fever and dengue diseases recognized by English observers as being distinct but which he believes to be the same, and calls the form met with in the eastern Mediterranean Mediterranean dengue

In the following table the generally accepted characters of the two diseases are compared

	Dengue	*Pappataci Fever*
Pains	—Articular and muscular Very violent	Muscular as in influenza
Eruption	—Polymorphic, with or without desquamation	No eruption Simple redness of face and trunk
Fever	—Duration, forty eight hours to four days with relapses	Two to four days without relapses or very rare

The following is a description of the fever as met with

After an incubation of thirty six to forty eight hours there is an abrupt onset with congested face and conjunctivæ photophobia and headache At the climax of the fever the temperature is high but the pulse is not more than 100 pains in neck lumbar region knees and the small articulations are often severe anorexia and constipation urine is increased and occasionally contains albumen Eruption on dorsal surface of hands, wrists, feet, knees and ankles, rarely on limbs and body polymorphic confluent, morbilliform or maculo papular becoming vesicular at times Œdema of hands and feet has been noticed desquamation is exceptional The eruption may be absent Duration of fever two to five days generally three Convalescence is long, followed by asthenia Relapses may occur four or five days after the temperature has fallen

In the Dardanelles type the eruption was generally absent and relapses were common In the Macedonia form the eruption was present and relapses were rare According to the author the onset of the disease was in the hot summer months and it bore a direct relationship to the appearance of sandflies it was also not met with in open camps but

[illegible] the troops [illegible] the walls of which were [illegible] breeding-grounds for the pappatasi flies

Armand Delille also describes Mediterranean dengue from the same areas and definitely attributes the disease to sandflies the fever lasting from three to six days

(The disease bears a close resemblance to the form of dengue or seven day fever seen at Bombay and Indian ports, which is generally attributed to mosquito infection though not proved) P W B-S

MACFIE (J W S) Observations on Urinary Amœbiasis *Ann Trop Med and Parasitol.* 1916, December vol x No 3, pp 291 303

As amœbæ are so often the cause of dysentery in certain endemic areas it is quite possible that they may also infect the urinary tract viz, the portal system, through the general blood stream or by means of fistulæ between the intestines and bladder The earliest case of urinary amœbiasis was recorded by Baelz in 1883 from a patient in Japan, which was called *amœba urogenitalis* It was a phagocyte of red blood cells and had a vesicular nucleus Three cases have recently been described from Accra, West Coast Two were natives, one was a European The latter, a man aged 37, complained of frequency of micturition and a deposit in the urine he had never had dysentery He believed that he was suffering from gonorrhœa, but this was disproved bacteriologically The condition was intermittent and chronic In the sediment pus cells, flakes, a few red blood cells, and peculiar spherical greenish bodies were found some of which were seen to be living amœbæ He was treated with hypodermic injections of emetine and rectal massage of the vesicular amœbiasis He derived benefit but was not cured The amœba could not be differentiated from *E histolytica* and the cystic stage with four nuclei was present P W B S

THE TOXIC EFFECTS OF TRI NITRO TOLUENE

Summary of the Discussion held by the combined Sections of Medicine Epidemiology and Pathology, Royal Society of Medicine, on January 25 1917

BY THE CHAIRMAN SURGEON GENERAL H D ROLLESTON C B, M D F R C P R N

THIS discussion, professedly on the toxic jaundice of munition workers and troops has to all intents and purposes resulted in a symposium on the toxic effects of tri nitro toluene This is a distinct advantage from a practical point of view for Dr Legge, to whom the Society is greatly indebted, not only for his introductory remarks but also for great help in attracting speakers with experience has pointed out that tetrachlorethane is no longer employed in doping aeroplanes and that the jaundice due to this cause is no longer likely to occur Further, the other minor illnesses due to tri nitro toluene are probably thirty times more frequent than jaundice and as many thousands of workers are employed in the handling of tri nitro toluene the problems of its toxic effects are of the greatest importance in preventive medicine and the production of munitions for

the succe[illegible] of the war The [illegible] of tetra chlorethan[illegible] to benzol ur[illegible] with those o[illegible] great value of [illegible] medical mee in chr[illegible] olenic works is the [illegible] effects of this most [illegible] Vbridge [illegible] important points brought out [illegible] may thereto [illegible]

MECHANICAL [illegible] TOLUENE

Tri nitro toluene [illegible] as low as [illegible] Lord Chetwyd argues that the p[illegible] the body by [illegible] of nitroes fumes on the circumstantial evidence that the incidence of as toxic effects varies with the ventilation of the factories—thus the circulation of air is defective, and fumes are given off by molten tri nitro toluene the toxic effects become more frequent whereas good ventilation is accompanied by freedom from illness On the importance of good ventilation as a prophylactic measure there is general agreement but it is conceivable that its effect is to improve the general health and resistance just as good feeding diminishes the incidence of gastritis among the French workers Dr Benjamin Moore's analytical and experimental investigations appear to prove that the skin is the main channel of absorption of tri nitro toluene and he insists that inhalation of its fumes or of its dust does not play any part There is some evidence that an oily condition of the hands such as may result from handling vaselined silk bags favours absorption Personal susceptibility has some influence in determining the incidence of symptoms and whether they appear after a short or after a considerable period of work This is well shown in the case of dermatitis But the amount of the exposure, or in other words the dose of the poison, is the more important factor in producing the toxic effects The greatest incidence of jaundice occurs in the third month of employment, and it has been suggested by Dr Collis that after a time the workers attain a certain amount of immunity against the poison

SYMPTOMS AND TREATMENT

Dermatitis is due to the local action of the explosive According to Lord Chetwynd it is caused by the ammonium nitrate combined with tri nitro toluene, but no other speaker referred to this distinction It occurs on the parts exposed to contact with the powder, especially the hands, where cheiro pompholyx is common Discrete red patches may occur on the dorsal surfaces and the wrists The face and neck may show a diffuse erythema and if there is dust on the floor the feet may be attacked It is often seen during the first week of work and tolerance is readily established It gives rise to severe itching The treatment consists in the use of zinc and bismuth ointment or of calamine lotion

Gastritis—(1) Irritative During the first week of work vomiting in the early morning and occasionally after food with some loss of appetite, ascribed to swallowing tri nitro toluene, to which the stomach soon becomes tolerant may occur A purge, a holiday for a day or two and though rarely necessary bismuth, cure the condition (O Donovan)

(2) Toxic gastritis is much more important Though it depends on absorption of tri nitro toluene from the skin it is rarely associated with

[illegible] the following signs and [illegible] dusky [illegible] consumption, [illegible] and [illegible] to removal from work [illegible] alkalies (10 [illegible] in each pint of milk) [illegible] acidosis [illegible] by water and the correction of constipation.

Toxic [illegible] employed in handling [illegible] toluene [illegible] have been 181 (males 90 [illegible] 111) [illegible] of [illegible] which [illegible] follow. [illegible] the [illegible] skin [illegible] the exposure [illegible] from the [illegible] toxic [illegible]

[illegible] such as [illegible] pressure [illegible] dark [illegible] often quite [illegible] the complete [illegible] that some [illegible] constipation [illegible] the pigment [illegible] blood [illegible]—and that they should be [illegible] as to [illegible] at [illegible] generally resembles simple catarrhal jaundice and biliousness [illegible] constipation is often but not always with pale stools. The [illegible] and though fever is usually absent there may be [illegible] temperature (100 to 10[illegible]). The prognosis is uncertain [illegible] symptoms such as hæmorrhage and convulsions due to hepatic [illegible] The treatment is on the same lines as in toxic [illegible] the antagonism of acidosis by alkalis being especially important.

Anæmia.—Workers in [illegible] although their blood is normal on examination may appear anæmic probably from vasomotor changes (O'Donovan). In workers [illegible] the red blood corpuscles, hæmoglobin and colour index are usually normal and the leucocyte count is often slightly raised. [illegible] in women workers who are otherwise well and it has been [illegible] though not satisfactorily proved (Panton) that this is due to [illegible]. In cases with toxic effects aplastic anæmia resembling that produced by benzol may result: there is grave anæmia without the nucleated cells and other regenerative changes characteristic of pernicious anæmia, a diminution in the total leucocyte count (leucopenia) with a fall in the percentage of the polymorphonuclears and a relative lymphocytosis. This anæmia, which is fortunately extremely rare, may occur alone or be combined with toxic jaundice. It is a very fatal condition and as yet no treatment can be considered effective.

PATHOLOGY

The morbid appearances seen in twenty two carefully examined cases with toxic jaundice, thirteen of which were females show very great reduction in the size and weight (17 to 36 oz) of the liver which is in a condition of yellow and red atrophy There are yellow projections in which the destructive process is less advanced than in the red areas the left lobe being more affected than the right The lesion in fact is the same as that long familiar as acute yellow atrophy The process is one of degeneration and necrosis of the liver cells associated with infiltration and subsequent fibrosis resembling ordinary portal cirrhosis The liver cells which do not contain hæmosiderin show little attempt at compensatory regeneration The small bile ducts are inflamed, thus causing the jaundice which is therefore not hæmolytic The kidneys and myocardium undergo fatty change and there may be subserous hæmorrhages

Future research may show what derivative of tri nitro-toluene exerts the toxic action on the body and if more than one product is concerned in the changes induced in the stomach, liver, kidneys and bone marrow

PROPHYLAXIS

This is obviously the most important question but as the methods are known to official use it is unnecessary to enter into great detail In the first place the absorption of the poison should be prevented by minimizing the opportunities of contact between the skin and tri nitro toluene Care must be taken to avoid spilling of the powder on the tables floors and the outsides of the shells and bombs The hands should be kept clean and freed from adherent tri nitro toluene by a solvent such as acetone (Moore) Similarly the hair and underclothing must be kept free from the powder Periodic alternation of shifts so as to reduce the exposure to the poison and prompt removal when toxic symptoms threaten are essential Good ventilation substantial meals and exercise, are important to maintain a good standard of health and to keep the bodily resistance high The excellent effects of thorough prophylaxis were shown in Fleet Surgeon R C Mundey's remarks

News of the Service.

MARRIAGE.

[illegible] Chapel [illegible] R.N. [illegible] of Lee [illegible] Colonel [illegible] R.N. [illegible]

CASUALTIES.

[illegible] Officer was killed [illegible] R.N. [illegible] Walls, R.N.V.R.

HONOURS AWARDED—MENTIONED IN DISPATCHES.

[illegible]

The King has been graciously pleased to give orders for the following appointment to the Most Honourable Order of the Bath:—

To be Ordinary Member of the Civil Division of the Third Class, or Companion of the said Most Honourable Order:—

Inspector-General [illegible] M.D., R.N. (retired).

The King has been graciously pleased to [illegible] the following [illegible] to the Distinguished Service Order to the undermentioned Officers in recognition of their services [illegible]:—

Fleet Surgeon [illegible] M.B., R.N.

[illegible] medical [illegible]

His Majesty the King has been graciously pleased to approve [illegible]

Awarded the Distinguished Service Order:—

Staff Surgeon [illegible] M.B., R.N. [illegible]

The King has been graciously pleased to [illegible] Distinguished Service [illegible] Officer:—

Surgeon [illegible] R.N.

In recognition of his services [illegible]

Officers selected for special promotion for War Services:—

Fleet Surgeon [illegible] R.N.

Has been selected for special promotion in recognition of his gallantry and [illegible] Officer of H.M.S. [illegible] when that ship was [illegible] September 1914.

1 1917

His Majesty the King has [illegible] granted to [illegible] the Cross of the undermentioned Officer [illegible] gallantry [illegible] the Field —

Temporary Surgeon Fr[illegible] [illegible] attached [illegible] for conspicuous gallantry [illegible] determination in dressing the [illegible] mounted for the field [illegible]

His Majesty the King has [illegible] the undermentioned [illegible] Medal for Meritorious Service in the Field —

Temporary Sergeant [illegible]

[illegible]

PROMOTIONS.

[illegible] be promoted to the [illegible]

[illegible] M B B A J Macdonald M [illegible] D S O M [illegible] Lieutenant [illegible] A [illegible] been promoted to [illegible]

[illegible]

APPOINTMENTS.

[illegible]

[illegible] H J Brown to be [illegible] A Machin [illegible] to be [illegible] the Edgar [illegible] Lieutenant [illegible] Minister [illegible] E Ellicat to the Warrant [illegible] and addl W [illegible] Director [illegible] J Gilmore to the Belfast [illegible]

[illegible] Carr M B to the Concord [illegible]

[illegible] R [illegible] well, M B [illegible]

[illegible] Colloft T A Smyth M [illegible]

[illegible] A H Jo[illegible]

R N V R C I C [illegible]

[illegible] the [illegible] broke [illegible] M [illegible]

[illegible] M B to [illegible] Mrs [illegible] Surgeon [illegible] R [illegible]

[illegible] Hospital Sick S [illegible]

[illegible] Surgeon R N V R [illegible] Farm

[illegible] Surgeon R N V R [illegible]

[illegible] Surgeon R N V R [illegible]

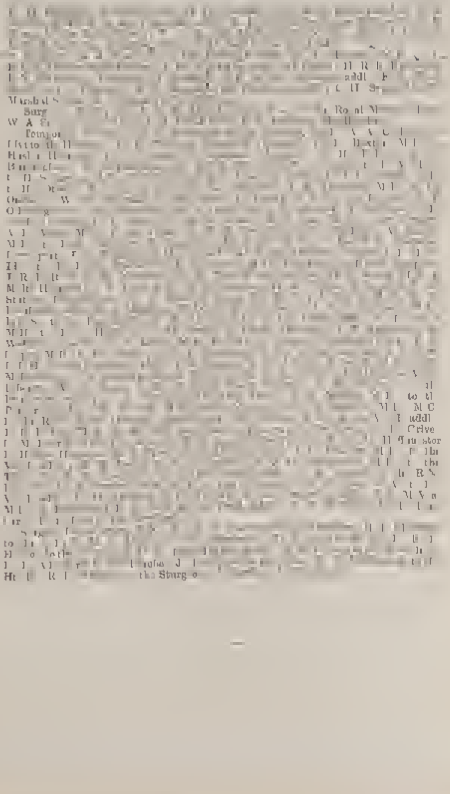
[illegible] Surgeon R N V R [illegible]

[illegible] Surgeon R N V R [illegible]

[illegible] Surgeon R N V R [illegible]

[illegible] Surgeons H R B Hall To the V [illegible]

[illegible] Surgeon R N V R [illegible]



NAVAL MEDICAL COMPASSIONATE FUND

Account of Receipts and Payments for year ending December 31, 1916.

	£	s.	d.
[illegible] 1916	586	18	5
[illegible]	265	0	0
[illegible] Account	10	8	1
[illegible]	2	1	8
[illegible]	100	16	0
	£714	19	3

		£	s.	d.
Awards to Orphans and Widows		177	[illegible]	[illegible]
Secretary's Allowance		18	3	[illegible]
Auditor's Fee		2	2	1
Messenger's Allowance		1	0	0
Balance at Bank on December 30 1916 —				
Deposit Account	£500 0 0			
Current Account	216 14 3			
		616	14	3
		£714	19	3

[illegible] this Account and found it to be [illegible] as Auditor have been met [illegible] £65 11s 2d includes £65 11s 2d belonging [illegible] investment [illegible] Bank of England in [illegible] December 31 1916 as attached

JOHN TENNEY
Auditor

In addition to the above Cash Balance the sum of £10 600 £2½ per cent Consols was standing at the Bank of England in the names of the Trustees at the close of the accounts

H McNAIR *Deputy Surgeon General*
Hon Treasurer

[illegible] the Directors of the Fund — [illegible] General Sir Arthur W Ma[illegible] K C B in the Chair the sum of £20 was distributed amongst the [illegible] General Sir Arthur W May, K C B in the Chair the sum of £40 was distributed amongst the [illegible] £500 in 5 per cent War Loan Stock

ASTLEY COOPER PRIZE

[illegible] Prize of Three Hundred Pounds, under the [illegible] shall be awarded to the author of the best [illegible] the Lungs and Pleura.

[illegible]

COLLECTION OF PATHOLOGICAL WAR SPECIMENS

(Letter sent to Hospital Ships and Hospitals)

Medical Department, The Navy, Admiralty,
February 28, 1917.

In reply quote No. and date
M.D. [illegible]

Sir,—I have to [illegible]

Specimens [illegible]

(1) [illegible]
(2) [illegible]
(3) [illegible]

(4) [illegible]

(5) [illegible]

(6) [illegible]

(7) [illegible]

(8) [illegible]

[illegible]

[illegible] W. MAX

[illegible] *General*

ADMIRALTY WEEKLY AND MONTHLY ORDERS ISSUED FROM DECEMBER 8, 1916, TO MARCH 1, 1917

(Only the more important Orders pertaining directly to the Rules of Medical Practice are included, and even these are condensed.)

*3131.—Burns and Scalds—Treatment.

(M.D. 3614/16.—24.11.1916.)

Carbolized gauze should be used for the purpose of cleansing burns and scalds, and should be supplied to each Hospital, Hospital Ship and ship having a Medical Officer or Surgeon. Requisitions should be made on

The Superintending Pharmacist
Royal Victoria Yard
Deptford

[illegible] only should be taken on charge or issued [illegible] Hundred Grammes and Half-a-pound Tins.

3346.—Surgeon Probationers R.N.V.R.—Passage &c., Expenses on Demobilisation.

(M.C. 24397.—8.12.1916.)

Surgeon Probationers who are allowed to be demobilized in order that they may [illegible] recognized courses will not be entitled to the repayment of any passage or other expenses incurred in connection therewith.

3506.—Medical Transport Office, Hull.

(M.D. 41340/16.—15.12.1916.)

[illegible] the Medical Transport Office, Hull, are carried [illegible]

Telegraphic Address: Medical Transport Office, 3, Sunny Bank, Hull.
Telephone Address: Mediamy, Hull.
Telephone Number—Central 602.

(W.O. 3031/1916 is cancelled.)

207.—Bags and Hammocks of Patients admitted to Hospitals—Loss.

(N. 55019/17.—13.1.17.)

[illegible] the frequency of losses and difficulties that have occurred in tracing bags and hammocks, Admiralty [illegible] are drawn to the necessity for sending sick vouchers [illegible] to hospitals. In such quarters, in certain instances, do not admit [illegible] effects being sent out on the form, it should be stated what [illegible] actually accompanies the men to hospital, i.e. bag and hammock.

[illegible] is essential that the baggage should be properly secured and labelled [illegible]

(K.R. and A.I.—Art. 1302.)

3549.—Dental Treatment.

(M.C. 19153.—22.12.1916.)

[illegible] 11/1916 relating to the dental treatment of officers and men whose [illegible] available [illegible] given rise to some misapprehension, it is [illegible] that in future the expense which will be regarded as reasonable within the [illegible] that order are as follows:

[illegible]

(M. [illegible] 341/1915.)

513.—Mercantile Ratings—Transfers to T. 124X and Medical Examination

Commissioned *Fleet* Auxiliaries.

(N. 9813/16.—25.12.1916.)

It is held that the procedure laid down in paragraph 9[illegible] of the Memorandum N.O. 1824/1916 may be carried out in respect of those ratings serving in Commissioned Fleet Auxiliaries who were transferred from T. 124 to Agreement T. 124X without signing T. 124X. Commanding Officers should [illegible] with the [illegible] to the effect that [illegible] signed T. 124X [illegible] rate of pay and [illegible] certificate [illegible] to [illegible] they served.

(2) The attention of Commanding Officers and Medical Officers in Commissioned Fleet Auxiliaries is drawn to the [illegible] standard of fitness [illegible] engaged under T. 124X. [illegible] Medical Officers [illegible] —

(1) He [illegible] heart [illegible] organs.
(2) He [illegible] and he [illegible] 15 [illegible].
(3) [illegible]
(4) He [illegible].
(5) He [illegible] syphilis.
(6) He [illegible] suffered from [illegible].
(7) He [illegible] 15 [illegible] separately [illegible] 24 [illegible].
(8) His general physical [illegible] to enable him [illegible].

Wh[illegible] Naval Barracks [illegible] Portsmouth [illegible] after signing T. 124X [illegible] capable of performing the duties for which he was engaged [illegible] standard of physical fitness.

514.—Drunkenness—Medical Examination.

(N.L. 11 5091/17.—26.1.1917.)

The attention of Medical Officers is drawn to the necessity of making a thorough and complete medical examination when they are called upon to examine an officer or person with a view to deciding whether he is drunk or sober.

(K.R. and A.I.—Art. 6016.)

6.—Royal Naval Hospital, Granton

(M.D. 17/2.—5.1.1917.)

[illegible] of the Royal Naval Hospital [illegible] through [illegible] Naval Hospital Granton [illegible] M.O. 2556/16 [illegible]

[illegible] Medical [illegible] Edinburgh.

(M.O. 2556/16 is cancelled.)

(C.M.O. 163/16.)

117.—Subsistence Allowance—Nursing Sisters

(M.C. 821/17.—26.1.1917.)

[illegible] subsistence allowance payable to Nursing Sisters [illegible] will be 15s. a night reduced to 10s. a night after 14 nights [illegible] Appendix IV of the Home Dockyard Regulations.

(Home Dockyard Regulations—Appx. IV.)

631.—Nursing Sisters and Reserve Nursing Sisters—Board and Washing Allowance

(C.L.—16.2.1917.)

[illegible] decided that temporarily during the War, with effect [illegible] 1916, Nursing Sisters and Reserve Nursing Sisters [illegible] Board [illegible] allowance at the increased rate of 19s. a week [illegible] week.

856.—Dentures—Supply

(M.D. 9760/16.—2.3.1917.)

[illegible] period of the War all ratings will be allowed dentures at the public [illegible] that the [illegible]

[illegible]

[illegible] should not be forwarded unless the [illegible]

[illegible] dentures to be made at the R.N. Depot [illegible] applications to be made through [illegible] Medical Officer of the Depot [illegible] not to be supplied [illegible] together with any [illegible] Establishment [illegible] Form M. [illegible] filled in. [illegible] Naval Dental Surgeon [illegible]

[illegible] accident [illegible] corroborative [illegible] of dentures.

(M.O. [illegible] and [illegible])

3147.—Drinking Water: Measures to Ensure Purity

(N.S. C. [illegible] 10 [illegible]—13.12.16.)

[illegible] in regard to [illegible] for ensuring the [illegible] Water [illegible] are promulgated for [illegible]

[illegible]

1— [illegible]

2 On a [illegible]

3. [illegible]

4 [illegible]

5 [illegible]

6 [illegible]

[illegible]

OBITUARY

Killed in Action

[illegible]

Died

[illegible]

Volume III July 1917 No 1

Journal of the Royal Naval Medical Service.

Original Articles.

THE CARREL DAKIN METHOD OF TREATING INFECTED WOUNDS

BASED ON A REPORT SUBMITTED TO THE DIRECTOR GENERAL MEDICAL DEPARTMENT OF THE NAVY

By Temporary Surgeon F G Schlesinger, M B B Sc, L R C S Eng., R N

Since my appointment to No 9 Red Cross Hospital which was raised and organized by Millicent Duchess of Sutherland, we have carried out a systematic trial of the Carrel-Dakin method of treating infected wounds in a large number of severe cases with results which appear to us to be considerably better than those achieved by other methods previously in use. Owing to pressure of work, it has unfortunately been impossible to keep more than a relatively few cases long enough for final results to be observed, but in the majority we have been enabled to render the wounds surgically sterile before transfer to England

The result which this method of treatment endeavours to obtain is a rapid surgical sterilization of infected wounds so that they may be completely, or in some cases partially, closed and the patient be spared the dangers and discomforts of prolonged suppuration and the lengthy tedium of healing by granulation

This process is accomplished by the introduction into all parts of the wound at frequent intervals of a suitable fluid antiseptic

Antiseptic Selected —Experiments were carried out at Dr Carrel's hospital to determine the most suitable antiseptic to employ in

T

[illegible] and sterilization of infected wounds. The [illegible] in a solution of sodium hypochlorite, [illegible] by a method devised by Dakin and [illegible]

[illegible] the adoption of Dakin and Dufresne's [illegible] to a greater extent than any other [illegible] following properties which constitute [illegible] purpose in view

(1) An efficient bactericidal power in the presence of blood [illegible], and in a concentration in which there is—

(2) An absence of harmful action on the tissues of the patient

(3) Non interference with the phagocytic action of white blood [illegible]

(4) Absence of toxicity if absorbed into the system

(5) Destructive action on the bacterial toxines present in pus

(6) A solvent action on dead tissues

(7) Cheapness and availability

The bactericidal action of Dakin's solution has been tested in [illegible] by its action on suspensions of streptococci staphylococci [illegible] *Welchii* &c. in water with the addition of horse serum [illegible] these were found to be killed by a strength of 1 in 2,000 to 1 in [illegible],000. Careful experiments were also conducted in vivo and [illegible] the solution to be powerfully bactericidal. The action of [illegible] fluid on the tissues of the organisms was worked out by M. Lecomte du Nouy who has devised a mathematical formula [illegible] imputing the normal rate of growth of epithelium. While the action of Dakin's fluid leads to a great acceleration of growth in the epithelium of infected wounds he has shown this to be due to its antiseptic properties, and has demonstrated that on sterile epithelium it has a slight inhibiting action which is however negligible in amount.

Other workers have shown that when samples of pus treated with hypochlorite were tested against white blood cells the phagocytic action was far greater than if untreated pus were used. Also pus treated with Dakin's solution and injected subcutaneously into guinea pigs produced no symptoms of toxemia, where is ordinary pus gave rise of course to the usual toxic disturbances.

The action of Dakin's solution on absorption into the system has been carefully studied on guinea pigs and it was found that *subcutaneous* injections amounting to $\frac{1}{10}$, $\frac{1}{5}$ and $\frac{1}{2}$ of their body weight were quite harmless. Direct *intravascular* injection is however extremely fatal owing to its strong hæmolytic action.

Dakin's solution has the valuable property of rapidly splitting protein into soluble substances which by their reactions would appear to be amino acids and this property which has been very little insisted on appears to us to be perhaps the main factor in its success and incidentally to open up the whole question of the treatment of septic wounds from a new view point

It has always appeared to us somewhat questionable at the best as to what relation the bactericidal properties of a substance is determined by experiments *in vitro* bear to its *in vivo* action when applied to wounds The fact seems rather to have been lost sight of that pus in a wound, and the superficial layers of dead or dying tissues which constitute its walls, are in reality *outside* the body Consequently the bactericidal action of any fluid on organisms which have penetrated into the walls of a wound or even to the depths of the dead tissue in it must be at the least problematical Any method which rapidly deprives the infecting organisms of the efficient food which dead tissues provide and which eliminates from the wound everything but the living resisting fighting cell must tend to turn the scale to the advantage of the body and to the disadvantage of the organism which is thus forced to continue its attack under the least favourable conditions of food and environment

Preparation of Dakin Dufresne Solution —In preparing Dakin-Dufresne solution accuracy of technique is essential, but the method is simple and can easily be acquired by any dispenser in a short time It aims at securing a solution containing between 0 45 and 0 5 per cent of hypochlorite and devoid of any free caustic soda

Owing to the great variability of the chlorinated lime on the market it is necessary to standardize a representative sample of each supply received, and this is done, in terms of the active chlorine it contains by a simple titration against decinormal sodium hyposulphite, using iodine as an indicator

Supposing a given supply of chlorinated lime to contain 25 per cent of active chlorine the following amounts are necessary for making 10 litres of a solution containing 0 175 per cent of sodium hypochlorite —

Chlorinated lime (25 per cent active Cl)	154 grm
Anhydrous sodium carbonate	92
Sodium bicarbonate	76

(The amounts vary according to the strength of the chloride of lime and a table has been prepared from which they can be read at a glance when the percentage of active chlorine found by titrating a sample of the chlorinated lime to be used is known)

[illegible] is placed in a 12 litre flask, shaken with [illegible] allowed to stand over night. The sodium [illegible] dissolved in [illegible] litres of cold water and poured into the [illegible] and allowed to stand until the precipitate [illegible] half in bottom the clear fluid is syphoned off [illegible] ready for use. The fluid should be just coloured with potassium permanganate which helps to preserve it from the action of light. The solution should be tested at intervals to see that its hypochlorite content remains constant by titration against decinormal sodium hyposulphite.

Method of Application.—The antiseptic being chosen it is necessary to have a method of ensuring that it shall be brought into intimate contact with all and every part of the wound, and that it shall remain in contact without any diminution of strength. To achieve this result, Dr Carrel has elaborated the method of introducing the fluid by a system of rubber distributing tubes leading to all parts of the wound. In order that this may be carried out effectually the object to be attained must be borne in mind during any surgical procedures, and certain general principles should be carefully observed.

Surgical Technique.—The same surgical principles hold good as in any operative treatment of wounds, but with certain exceptions which are important if the method is to have the best chance of success. Foreign bodies and dead tissues are removed in the ordinary way and free access *must* be obtained to all and every pocket and diverticulum of the wound. It is here that a difference in surgical procedure does exist, in that the dependent counter incision for purposes of drainage is not only unnecessary but disadvantageous. Since it is desired to keep the antiseptic fluid in contact with the tissues dependent counter openings merely defeat that object by allowing the fluid to escape forthwith, and consequently, all wounds and pockets should be opened as far as possible from the anterior surface, thus converting them into cup in well shaped cavities into which the distributing tubes lead and in which the fluid is constantly being renewed from the bottom. The possibility of such a departure from ordinary procedure is in itself of value by enabling one to plan incisions regardless of gravity and making it possible to avoid opening fresh planes to infection or exposing structures such as nerves to the late effects of scar tissue.

No hesitation need be felt about making even very large incisions on account of the time taken in cicatrization, since if

free access of the solution to all parts of the wound is provided for, they are readily sterilized and sewn up in a matter of a few days.

Immobilization.—With this, as with any other method of treating, infected wounds, and particularly wounds involving bones and joints, adequate immobilization and extension is an essential in no way second to the actual local treatment of the wound. It has been our practice here to attempt to secure complete immobilization of the affected limb, and at the same time to preserve to the patient freedom of movement in bed, a condition which is quite easy to attain by the use of pulleys and counter weights, so that a patient with for example a fractured femur immobilized and extended in a Thomas's splint, is able freely to raise or lower his injured limb, to move in bed, &c., without in any way interfering with the immobility of the actual injured part. At the same time, splints and extensions must be so arranged that the wound can be easily dressed without movement which can generally be made possible if the splint used is adapted to the particular lesion to be treated. It has been our experience that pain in a wound in which there is no pus under tension is invariably due to faulty immobilization while a spread of infection along tendons and muscles is very commonly due to the same cause. Extension has been applied usually by the use of Sinclair's glue, or in certain cases of knee-joint wounds or fractures of the femur, particularly those complicated by extensive buttock wounds by the use of Chutro's extension stirrup.

Chemical Sterilization of Wounds.

(Note.—In speaking of "sterilizing" a wound, the word sterile is used in a surgical and not a bacteriological sense. A wound is said to be sterile when it can be sewn up completely without subsequent breaking down or pus formation. From such wounds before closure a culture can however still be obtained, and consequently the word "sterile" is not strictly accurate, and is used in default of a better.)

In order to sterilize an infected wound, it is necessary to bring the antiseptic fluid into intimate contact with all parts of the wound, and to maintain it there at a constant strength.

This is done by introducing perforated, flexible rubber distributing tubes, which are connected with a reservoir containing the antiseptic, into all parts of the wound. The fluid is introduced intermittently (in practice every two hours), because although a continuous flow would be equally effective in theory, in practice it is evident that the very slow stream necessary in any continuous

method [illegible] [illegible] only th[illegible] [illegible] wound [illegible] distant

The distributing tubes are made of [illegible] internal diameter of 5 [illegible] and 6 mm [illegible] well [illegible] thus being kept patent and resistant and able to penetrate to all part of the wound and at the same time to resist the pressure of muscles and dressings One end of these tubes is occluded by a ligature and they are perforated with a punch of a 2 mm diameter over varying lengths from 5 to 20 cm For use on surface wounds the perforated area of the tube is covered with Turkish towelling which ensures a more even distribution of fluid These distributing tubes are united in groups of 1 2 3 or 4 by glass connections to rubber tubes leading to a reservoir The reservoir is either a glass ampoule of some kind or an inverted glass bottle with inlet and outlet tubes A clip on the tube leading from the reservoir allows the wound to be flooded with the requisite amount of fluid (See sketches (fig 1) kindly made by Miss Wilson-)

The method of applying the tubes is important, and differs somewhat according to whether the case is seen (*a*) within the first twelve to thirty-six hours, or (*b*) after several days or weeks, when it is actively suppurating In either case progress must be carefully checked by means of the bacterial control to be described later any delay in sterilization being dealt with by appropriate alterations in technique

Recent Wounds —In these the usual operative cleaning procedures are carried out with the modifications in technique previously described, and tubes are introduced into every part of the wound They are held in position by loosely-placed pieces of gauze the gauze being placed between or over the tubes and not between the tubes and the tissues On surface wounds the jacket tubes are used in order to ensure a more distributed flow of fluid

In cases of compound fracture great care must be taken that the fluid is led between the fragments of bone, as well as around them When all the tubes are in position the fluid is allowed to flow and the amount required just to fill the wound is noted and is the amount to be introduced every two hours Overflowing of the wound is to be avoided on account of the burning of the surrounding skin which is liable to follow

Wounds already Suppurating —In these, some kind of operative treatment has usually already taken place and it is well at first merely to introduce tubes as completely as possible without further interference An improvement in the bacterial count and the

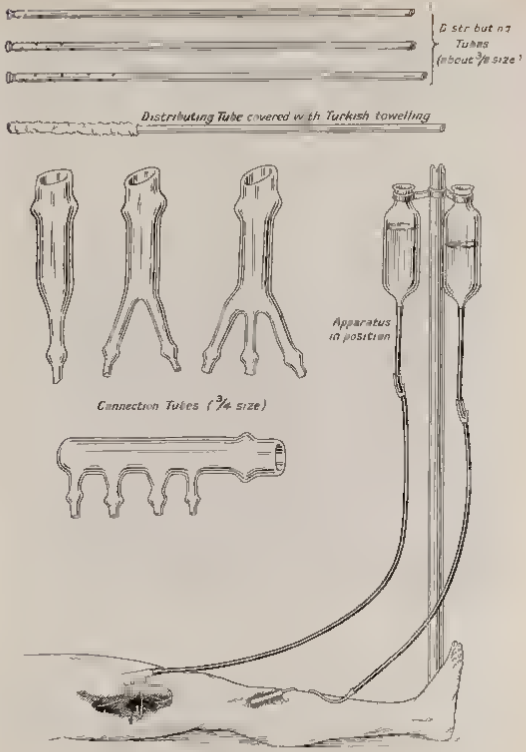


Fig. 1.—Apparatus

general condition will usually take [illegible] not, or if the improvement is not [illegible] other operative measures are required It will usually be found that some pocket or pockets have not been reached and these must be rendered accessible, while in the case of compound fractures it may be that collections inaccessible to the fluid exist between the fragments, or that some loose dead fragment of bone has been left In all cases the bacterial count must be taken as the index of efficient treatment, and any delay in the descent of that count must mean that the fluid is not reaching all parts of the wound and appropriate measures to remedy this must be taken

[illegible]

Dressings—Dressings are [illegible] twenty four or forty eight hours although the fluid is [illegible] allowed to flow every two hours both by day and night

It is a convenience in this [illegible] as well as a [illegible] economy to dispense with wool and bandages and to use sterile large pads consisting of two layers of gauze with a wool lining and [illegible] to fit the varying anatomical regions such as the thigh and

groin, axilla, shoulder, and back, &c By using these, which only require changing about once or twice a week, much less movement is required, and in addition the chances of displacing the tubes by the movements of bandaging are done away with

Dressings with this method are entirely painless, and take very little time. They should however, invariably be done by the surgeon as upon the efficient placing of the tubes depends the whole success or otherwise of the treatment In small wounds there is no trouble due to wetting of the bed by the fluid though in larger wounds this difficulty has to be met either by mackintosh sheets or by placing the limb or region in a metal tray which drains to a bottle under the bed. Sterile vaseline should be freely used to protect the surrounding skin from the effects of the fluid

Burning does not take place while the wound is discharging pus as the hypochlorite rapidly splits up on contact with the protein in the discharge When the wound is clean however, vaseline must be freely used or burning of the surrounding skin is likely to occur

The most careful aseptic technique must be followed at all dressings to avoid reinfection of sterile wounds, or contamination by new organisms of wounds which are still infected

Bacteriological Control—The progress of the treatment as regards the sterilization of wounds is controlled by bacteriological examination and it is by this means alone that one can know when sterilization is sufficiently advanced to permit of wounds being closed with safety As each wound needs to be examined bacteriologically every two or three days and as a skilled bacteriologist is not always available, the technique of this method of examination has been rendered extremely simple and consists in an examination of a smear taken from the secretions of the wound This smear should be taken at least two hours after the last instillation of the antiseptic fluid A sterile platinum loop is lightly rubbed on what appears to be the dirtiest parts of the wound, and a film is made from this on a glass slide which is then dried in a flame These films are stained with thionine blue and examined under a $\frac{1}{12}$ lens The number of organisms per field of the microscope is counted, the mean of several counts being taken, and a figure greater than 100 per field being reckoned as infinity These counts are entered on a chart similar to a temperature chart (see fig 3) under the figures 50 to 100, 30 to 50, 20 to 30, 11 to 20 10 to 15, 5 to 10, and 1 to 5 while when there is an average of less than 1 per field they are reckoned as 1 in 2 fields 1 in 5 fields, &c This method is naturally a rough one, but in practice it forms a most

efficient [illegible] When the number of organisms falls to 1 in [illegible] or 6 fields and remains at that figure or below for a considerable time or has been [illegible] and may be safely closed provided that the organisms consist of single cocci or diplococci. If however [illegible] bacilli, staphylococci in groups or streptococci in chains are seen the treatment must be persisted in until they have disappeared

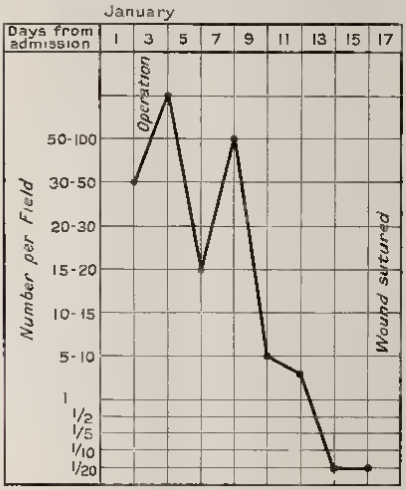


Fig. 9.—Bacterial Chart

The value, however of the bacterial curve is wider than this, since it forms a most efficient guide to operative interference and indeed, one comes to rely on it more in many cases than the temperature chart—which—as regards suppurating wounds, is chiefly an index of pus under tension

If the bacterial curve remains high for several days even if the temperature is normal it is almost certain that some part of the wound is not being adequately reached by the solution, or that some piece of clothing, dead fragment of bone, &c., remains in the wound and calls for appropriate treatment; or in other cases, that an insufficient quantity of solution is being introduced, or that the tubes are badly placed.

Isolated rises of the chart, if the general tendency is downward, can as a rule be disregarded, indicating either some temporary reinfection from the skin, or sometimes the temporary blockage or displacement of one of the tubes. It should be noted that after any operative procedure the curve usually rises rapidly but speedily settles down again, a fact the significance of which will be referred to later.

Clinical Effects.—The clinical effects of the Carrel Dakin treatment of infected wounds are most striking. Within a few days of beginning the treatment the dirtiest wounds assume a clean and pink condition, sloughs rapidly disappear, surrounding redness and oedema subside and the surface of the wound becomes covered with particularly fine and firm granulations. Pain is remarkably absent, and in practically no case does it persist after one or two days after the treatment. A further very noticeable feature is the absence of all smell, and the lack of the toxic general appearance which one has come to associate with the presence of infected gunshot wounds.

The pus in infected wounds changes in appearance, becoming gradually clear and oily in consistency, and after a period varying with the intensity of the infection existing when treatment is begun, disappears. Clinical absence of pus cannot, however, be taken as a guide to sterility, since the bacterial curve often shows a large number of organisms when the wound is clinically clean, while per contra, a wound may be organism free and yet show clinically considerable secretion.

The average time taken to sterilize wounds at Carrel's hospital, in a large series of cases, was from six to twelve days for wounds of the soft parts, and from twelve to thirty days for compound fractures, in cases where the treatment was begun early, and our experience confirms this.

In certain severe comminuted compound fractures, where the bacterial curve does not quite reach sterility, the wound may be closed with the exception of a track leading down to any potential sequestrum which can then be removed when it has had time to separate.

Further in cases of compound fracture with loss of substance a valuable advance has been made in that bone grafting can be safely performed at a much earlier period than formerly The wound should first be sterilized, and when this condition has been reached a bed for the graft is prepared in the usual way After this procedure the bacterial curve usually rises rapidly but if the treatment is continued the wound can speedily be resterilized, the graft inserted and the wound safely closed

If division of a nerve complicates the wound, it is considered safe to reunite it at the same time that closure of the wound is undertaken and by this means much time is gained as compared with the usual procedure in which the wound is first allowed to heal, and the nerve sutured at a secondary operation

Closure of Wounds—Wounds of the soft parts when the bacterial curve shows the presence of less than one organism per five or six fields for four or five days and such organisms consist of isolated cocci can be completely closed with safety In closing these wounds the growing epithelial and granulating edges are revised sinuses or pockets are obliterated by buried sutures and the skin edges are brought together by undermining and the usual procedures

In fresh wounds sterilized within ten days or less closure can at once be accomplished by bringing the edges together with adhesive strapping

In deep wounds which have suppurated freely traumatism must be avoided and if possible the deeper parts are brought together by pressure of dressings and the skin united by suture If this is not possible, the necessary dissection is performed sutures are inserted and sterilization is continued for a day or two after which the whole wound may be closed Muscles and nerves are united in the ordinary way Closure should not be unduly delayed when sterilization has been reached, owing to the liability to reinfection from contamination

Wounds complicated by Compound Fracture or Joint Injury—Such wounds can often be closed in the same way as wounds of soft parts The treatment of loss of substance of bone by bone grafts has been referred to, and cavities in bone may be filled with fat or muscle grafts, or by inert substances such as Beck's paste or other similar preparations

The principle should be observed that where there has been profuse suppuration, if extensive surgical measures are needed for closure these should be performed the wound left open, and a

[illegible] infection obtained [illegible] closing [illegible]

[illegible] of 100 cases of closed [illegible] only ten failed and [illegible] reopened

Results [illegible] Method—In [illegible] this method of treating infected wounds it must be borne in mind that the treatment is one in which exactitude of technique is essential and the final detail which has been arrived at after many experiments must be adhered to exactly if the method is to have a fair chance of success In several hospitals which I have visited in which the method is said to be in use it is applied without any regard to the principles involved or to the details of chemical and surgical technique, and with a lack of success which was to be expected

The general conclusion reached is that suppuration in wounds can be stopped and that the majority of wounds can be sterilized and closed

The general average of the cases shows that the duration of treatment of gunshot wounds can be greatly shortened as compared with the time taken by the usual expectant treatments and that the number of secondary amputations can be greatly reduced A table is appended showing the results while under our care of the first forty-five compound fractures treated by this method at this hospital and it will be seen that in the majority, sepsis came readily and comparatively rapidly under control In a very large number of muscle wounds without bony injury, treated during the same time, results have been perhaps more striking since sterility is reached much more rapidly and closure is a simple matter and attended by little risk Owing to the necessity for rapid evacuation it has been impossible to keep more than a few cases for complete closure and the object aimed at by us has been to get the infection completely under control before evacuating to England for any further measures

Major C S Ford in a report to the United States Army, gave the following figures from Carrel's hospital at Compiegne In a group of 135 wounds treated in 1915 121 were closed within twelve days The failure to close fourteen of these wounds (10 per cent) was due to general infection extensive destruction of tissue or want of sufficient skin and the consequent necessity for skin grafting

In a series of 500 wounds which were sterilized and closed only ten failed in union and had to be opened

In twenty-five compound fractures twenty two were closed eighteen of them being completely healed in less than thirty days

Dr C [illegible] treatment [illegible] in all [illegible] pound [illegible] days [illegible] During my [illegible] was receiving largely cases which had proved refractory in [illegible] hospitals after in most cases months of treatment

Dakin's solution acting as a solvent of blood clot, it might be expected that secondary hæmorrhage would be frequent If however care is taken to ligature all bleeding points during operation it is found in practice that the rapid abolition of suppuration [illegible] secondary hæmorrhage perhaps less frequent with this method than with others It is, however, our practice not to introduce the drain for twelve hours after operative measures to minimize the chance of oozing taking place

From the administrative point of view, this method of treatment presents many advantages In the first place the average duration of hospital treatment is very greatly reduced and in addition, owing to the rapidity with which suppuration is controlled a great economy in dressings is effected

The standardization of treatment leads to a greater simplicity and efficiency in working while the cost of the antiseptic employed (which works out approximately at 3 francs for 100 litres in the French hospitals) is considerably less than that of other antiseptics in general use

My thanks are due to Captain Morgan, R A M C, Lieutenant Sauer R.A M C and Dr C Dean, with whom this method of treatment has been jointly carried out, for permission to use their cases and to Millicent, Duchess of Sutherland and the staff of No 9 Red Cross Hospital for continued help and encouragement

NOTES ON FORTY FIVE CONSECUTIVE CASES OF COMPOUND FRACTURE TREATED BY THE CARREL DAKIN METHOD, AT No 9 RED CROSS HOSPITAL (MILLICENT SUTHERLAND AMBULANCE)

No	Nature of injury on admission	Days since receipt of wound	Time taken to sterilize 3 days from admission	Total days in hospital here	Method of fixation	Condition on evacuation to England	Complications and remarks
1	*Compound fract femur* Large external and posterior wounds suppurating freely Lower third	5	30	68	Chutro extension stirrup	Good union mobile knee joint, small sinus present	Two abscesses on outer side of thigh which were opened
2	*Compound fract femur* Large anterior wound, very septic Middle third	7	12	60	Chutro extension stirrup	Wound entirely superficial good union no sinus	*Nil*
3	*Compound fract femur* Large external and internal wounds free suppuration Middle third	12	36	50	Thomas's splint glue extension	Wound almost healed small sinus fair union	Also wound of right foot with fractured metatarsal, which healed well
4	*Compound fract femur* Large wounds on outer, inner and anterior surfaces of thigh Some suppuration	7	16	10	Chutro extension stirrup	Wound almost closed good union movement in knee joint returning	Multiple wounds elsewhere which healed well
5	*Compound fract tibia and fibula* Large internal and external wounds lower third leg Much comminution and sepsis	5	36	60	Suspension Thomas glue extension	Wounds healed except for one small sinus leading probably to a sequestrum	Small abscess round two pieces of dead bone dealt with
6	*Compound fract tibia* Large internal wound, also wounds of foot Acute cellulitis on admission	7	18	60	Back splint in suspension	Wounds healed firm union	Thrombosis of femoral vein, and of iliac for which reason stay in hospital was prolonged
7	*Compound fract tibia and fibula* Infection of ankle joint Large external wound Acute cellulitis	5	28	31	Suspension splint glue extension sole of foot	Wound healed except for small sinus joint quite clear	Foreign body removed from external malleolus

NOTE [illegible] AND FRACTURE [illegible] THE CARPET DARIN METHOD — *Continued*

	Nature [illegible]	[illegible]	[illegible]	[illegible]	Method of [illegible]	[illegible]	Complications and remarks
9	*Compound [illegible] joint*				Plaster of Paris and iron extension	Suppuration [illegible] and *am [illegible]* in lower [illegible] leg cut out	General condition precluded any long attempt at conservative measures
10	*Compound [illegible]* Small wounds [illegible] moderate	6	[illegible]	[illegible]	Back splint	Wound perfectly clean and partially closed no discharge	—
10	*Compound [illegible]* Multiple wounds of leg Extreme comminution	11	4	[illegible]	Suspension Thomas, sole of foot extension	Wounds perfectly clean position good no evidence of sequestra	Some secondary infection with *B pyocyaneus* dealt with by acetic acid paste
11	*Compound fracture* [illegible] Wound and fracture in upper third of leg both very slightly infected	[illegible]	[illegible]	[illegible]	Back splint	Wound perfectly clean and closing well; position of bone excellent	Large piece of metal removed at C C S
12	*Compound fracture tibia and fibula* Large wound outer aspect of middle third leg Much discharge	11	[illegible]	30	Back splint	Wound perfectly clean and ready for closure	—
13	*Compound fracture tibia and fibula* Destruction of almost whole of anterior muscles of leg gap of 1½ in in tibia. Very severely infected	3	30	58	Thomas's splint, glue extension	Wound closing rapidly length maintained, fibula united callus forming between tibial fragments	One division amputation was carefully considered owing to severity of wound, but sepsis came rapidly under control, and on discharge sinus had definitely begun
14	*Compound fracture tibia.* Very foul wound Much comminution	6	Not quite sterile on evacuation	23	Suspension Thomas, glue extension	Wound granulating and closing, probably some dead bone still present	Piece of metal removed on admission
15	*Compound fracture fibula* Large sloughing wound from head of fibula to lower third of leg	6	19	44	Back splint	Wound closed excepting for narrow granulating strip no sinus	

16	*Compound fracture fibula* Wounds of inner and outer aspect upper third leg Very septic	3	21	99	Back splint	Wounds healed except small surface area on outer side	Some secondary infection with *B. pyocyaneus* dealt with by acetic acid paste
17	*Compound fracture fibula* Large through and through wounds Copious discharge	3	8	15	Suspension Thomas with glue extension	Wound much smaller covered with clean granulations	On admission temperature 105 F patient's general condition bad Rapid improvement
18	*Compound fracture thum* Entrance wound posterior ⅓ left thum exit middle of crest of right thum Fracture of spines of lower lumbar vertebra	6	20	52	—	Wounds sutured when sterile primary union obtained	Cavity in thum was filled with a fat graft
19	*Compound fracture pelvis* Multiple wounds over whole body including wound penetrating [illegible]	3	—	—	—	*Died* fifteen days after admission General condition of shock became gradually worse and wounds showed no sign of repair	Iliac thrombosis and secondary hemorrhage from glutteal artery
20	*Compound fracture scapula* Large wound over angle of scapula Considerable comminution of the bone	1	14	27	Sling	Wound sutured when sterile primary union	—
21	*Compound fracture scapula* Large lacerating wound Copious discharge	7	8	12	Sling	Wound quite clean and granulating	Patient also had a sterile hemothorax which was aspirated, 90 cc being drawn off
22	*Compound fracture scapula* Wound over deltoid region Much comminution	5	16	36	Sling	Wound almost closed except for small granulating area	—
23	*Compound fracture scapula* Entrance over deltoid exit posterior aspect left chest Very septic	5	Not quite sterile on evacuation	14	Sling	Wound clinically clean	Patient had a severe purulent bronchitis traumatic pneumonia
24	*Compound fracture scapula* Large [illegible] over deltoid region [illegible] Neck of scapula Copious discharge	4	12	13	Sling	Wound healed except [illegible]	—

[illegible]

[illegible]	[illegible]	Time elapsed to sterilization from admission	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1	21	[illegible]	Suspended interrupted plaster of Paris splint	D[illegible]	[illegible] wrist [illegible] complete recovery [illegible] three weeks in dorsal position
[illegible]	6	Not quite sterile on evacuation	31	Thomas's splint glue extension	Wounds granulating [illegible] sloughs separated	Tourniquet had been left in originally for twelve hours considerable sloughing, where it had been
[illegible]	[illegible]	17	31	Right angled Thomas in suspension	Fairly firm union [illegible] quite superficial and clean position good	Movement of elbow joint good
[illegible]	[illegible]	Not sterile on evacuation	9	Thomas's straight arm splint	Wounds cleaning up well position good	—
[illegible] *Compound fract humerus* into elbow joint Joint full of pus Head of radius exposed in wound	6	58	70	Suspension extension tray	Joint quite closed, wound healed 20 of movement	Patient on admission was very mental, making treatment at first very difficult
10 *Compound fract humerus* Through and-through wound upper third arm Very septic	3	20	21	Extension with out splint	Position very good wound clean and granulating	—
11 *Compound fract humerus* Anterior wound middle third Much laceration of muscles	14	Not sterile on evacuation	14	Thomas's straight arm splint	Wound cleaning, position good	—
12 *Compound fract humerus* Anterior and posterior wounds middle third Much comminution	4	10	13	Thomas's straight arm splint	Wound clean position fair	—

33	*Compound fracture radius* Large wound lower end Great loss of substance	5	32	60	Suspension ex tension tray	Healed except for area size of sixpence which is granulating	Skin graft done when wound was sterilized
34	*Compound fracture radius and ulna* Large wound on ex tension aspect Very septic	1	19	35	Suspension ex tension tray	Wound closing rapidly all bone now covered	—
35	*Double compound fracture right and left radius* Multiple wounds Left wrist joint involved	9	18	10	Suspension ex tension tray	Right arm wounds sutured when sterile primary union left arm wound almost closed	Bacteriol examination showed *B tetani* in wound no symptoms developed
36	*Compound fracture radius* Large anterior external wound upper third Much comminuted	6	9	15	Suspension ex tension tray	Wound reduced to a small sinus position good	Considerable pain in distribution of median nerve
[illegible]	*Compound fracture radius and ulna* Through and through wound Middle third	8	7	1	Suspension ex tension tray	Wound clean and covered with granulations position of bones not very good	—
[illegible]	*Compound fracture radius* Large wound inner aspect middle third	8	13	11	Straight arm Thomas	Wound clean sinus still present leading down to bone	Some secondary infection with pyocyaneus dealt with by acetic acid paste
39	*Compound fracture ulna* Large through and through wound lower third Ulnar nerve divided	5	28	10	Suspension ex tension tray	Wounds almost healed no discharge ready for suture	Also wound which removed little finger of hand on same side
40	*Compound fracture ulna* Multiple wounds of forearm including very extensive one posteriorly	5	17	23	Suspension ex tension tray	Wounds much smaller and perfectly clean	Small abscess of trochlear gland opened
41	*Compound fracture ulna* Wound posterior surface	5	19	12	Straight arm Thomas	Wound clean probably some sequestra still present	Still some discharge, but no organisms
42	*Compound fracture ulna* Small wounds Middle third	4	10	11	Straight arm Thomas	Wound clean, position good	—
43	*Compound fracture ulna* Large wounds outer and anterior aspect Middle third	5	Not sterile when encysted	10	Suspension ex tension tray	Wounds cleaning rapidly, position good	—
44	*Compound fracture both clavicles* Through and through lateral wound of clavicular region	5	28	41	No fixation possible	Wounds practically closed	Pneumonia thrombosis of right brachial and axillary veins pyuria, gradual recovery
45	*Compound fracture metatarsals* First second and third metatarsals fractured, big toe blown off, large wound, very foul	3	16	56	Back splint in suspension	Wound partially sutured re sterilized and finally completely sutured with primary union	Firm union of fractures, very good mobility of foot

INTERMITTENT INSTILLATION OF EUSOL IN THE TREATMENT OF INFECTED WOUNDS

J. [illegible] Acting Staff Surgeon [illegible] MCR MD FRCSEd
[illegible]
RN Hospital S[illegible] [illegible] of Scotland

The value of hypochlorite in the treatment of infected wounds now widely recognized but whatever doubt Wright may have had on the value of antiseptics in wound treatment has been largely dispelled by the great weight of evidence which is now available to show that antiseptics rationally employed are of [illegible] importance in combating infection

In employing eusol in the treatment of large lacerated and dirty wounds the frequent renewal of fresh antiseptic to all parts of the wound is the essential factor A method that will ensure this and in addition will dispense with frequent and painful dressings is the object we have aimed at and whilst the method which we have used in this ship since June 1916 is less elaborate than that recommended by Carrel it has given the most gratifying results A patient admitted with a large lacerated wound is given a general anæsthetic foreign bodies removed and contused tissue cut away The wound is then thoroughly washed out with 1 in 20 carbolic solution and then with saline Almost invariably there is some undermining of the skin present and a small counter opening is made at the highest point of undermining A long rubber tube is drawn through this opening sufficient being drawn through to extend along the whole length of the wound Numerous small lateral openings are made in this portion of the tube and a ligature is tied round its end About 1 ft of the tube is left projecting externally to facilitate access for injecting eusol A second counter-opening may be made at the lowest point of the undermined area but it is not essential The whole wound is now lightly packed with gauze wring out of eusol a bulky wool dressing applied and through a hole in this the free end of the rubber tube is brought and is kept readily available under the last turn of the many-tailed bandage which secures the dressing Thus without in any way disturbing the dressing a steward can with a glass syringe inject 2 oz of eusol every one or two hours and in this way keep the whole packing saturated with fresh eusol It has been found that even

[illegible] contamination (dust, [illegible] for from four to eight days [illegible] together avoided

The w[illegible] but more especially of leaving it in [illegible] d by some. I am, however convinced [illegible] infected wound surfaces apart, and secondly in [illegible] ing up the fresh ensol as injected and keeping it in contact with every corner of the wound The importance of commencing the ensol installations at the earliest possible moment cannot be over estimated, and by the adoption of some method similar to the one here described at the first dressing in cases of lacerated wounds ensol might be regularly injected *during the transport* of the case on ship or train without in any way disturbing either the dressings or the patient

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THE PRACTICAL USE OF AMBRINE IN TREATMENT OF BURNS

By Surgeon Henry Hutchinson

The article published in the April number of the Journal The Treatment of War Burns in which is mentioned the ambrine wax treatment now in use in the Service was of especial interest to me as I have had several opportunities of gaining information on this subject The following short account of it may be of interest to those who have not seen cases treated in this way

The success of ambrine, as of other treatments depends on the care that is taken with regard to details

Practical Instructions for the Use of Ambrine as advised by Dr Barter de Sandfort, Medecin Major, Hospital St Nicholas Paris

General Properties of Ambrine —Ambrine a mixture of wax and resin is solid when cold, but when heated to 70° C or 80° C becomes as fluid as water

Characteristic Properties —Ambrine is easily rendered aseptic by a direct heat of 120° C without special apparatus, and in any receptacle

It is analgesic and quickly deadens the pain of burns Indeed although when applied ambrine is at a high temperature (60 C or 70° C) it does not burn the tissues and causes almost immediate cessation of the severe pain caused by even superficial burns Ambrine forms, as it solidifies instantaneously on the wound, a warm varnish which isolates and sterilizes, and which owing to the cotton wool it contains (see 'Method of Use), preserves a temperature of over 41° C for several hours, provided always the precaution is taken of again covering the dressing with a layer of ordinary cotton wool held by a bandage

The web of wax and cotton wool forms a sheath adhering but not adhesive, under which the physiological growth and healing of tissues proceeds naturally The healing of wounds and in particular of burns by means of a supple skin, can thus be exhibited without scarring or definite functional impotence

Methods of Use —There are two methods of applying ambrine both of which are in constant use at the Hospital St Nicholas

(1) Spraying it on by means of a vaporizer

(2) Application with a soft brush

With regard to the first mentioned it is suitable for the early treatment as pain may be caused by the brush Also, spraying is more rapid but large areas should not be covered at once, as it is desirable to place the web of cotton wool and second coating of ambrine on while the first coating is warm, in order that they may adhere to each other A good description of this method which promises to become the most useful on board ship accompanies each ambrine spray apparatus supplied to the Service

A full account of the second method is given in describing the dressing

Ambrine is used hot on account of its being then in a liquid state (70° C or 80° C) To heat it, place a piece of ambrine in a receptacle (basin or cup) placed in a bowl containing a little water so as to constitute a water bath, which is made to boil gently for ten minutes

Precautions to be Taken—Between the two receptacles place a small piece of linen or hut to obviate the jump of the water while boiling When the water boils reduce the heat to prevent drops of water falling in the wax Ambrine free from water does not burn the tissues at 80° C—but it is not the same if it contains water even in the smallest quantity

When using the vaporizer supplied to the Service the ambrine should be boiled in it over a spirit lamp and then allowed to cool to a temperature of 140° F to 150° F At first, hold the sprayer at about 10 in from the burn, a thin coating is formed over the wound which can be increased by bringing the sprayer closer to the surface [1]

While heating, cut out a piece of absorbent cotton wool about the size of the hand and pull it apart into a web as fine as possible At the same time get ready the cotton wool and the bandage which envelop and secure the sheath of wax

The Dressing—When the ambrine is sterilized by boiling take a soft brush and place it in the ambrine, which is then disposed over the wound without pressing dabbing, not smearing it on It forms a kind of varnish Repeat this operation until the film is complete, taking care that it covers everywhere Next throw deftly over the first layer of wax one of the webs of thin cotton wool, prepared as above, so that it can be easily impregnated with ambrine and stick to the first film, as the brush charged with ambrine passes several times over the same place If the wound

[1] Further details will be found in the directions for use issued with each ambrine spray apparatus supplied to the Service

is extensive work l[illegible] all square [illegible] ll (10 cm by 10 cm) These small [illegible] stick to one inches

This procedure by [illegible] In order to obviate the coolness of the limb by [illegible] for it is essential to form over the whole extent of the wound a sheath at a uniform temperature which will be preserved for a long time owing to the intimate association of the ambrine and the absorbent cotton wool (Two layers of cotton wool successively soaked in ambrine can be applied though this is not absolutely necessary) When the web is complete and covered with ambrine, finish off by surrounding it with ordinary cotton wool held in place by bandages

N B —If these precise instructions are not rigorously conformed to great mistakes may be made Thus it sometimes happens that the web of absorbent cotton wool is applied directly to the wound, so as to cover it afterwards with a few layers of ambrine This false step has two disadvantages —

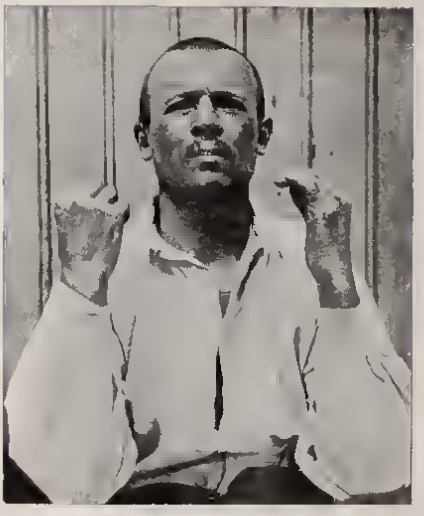
(1) It causes a painful burning sensation, from which it has been sometimes said that ambrine enhances rather than soothes the pain Now the application of ambrine by itself to a wound is easily bearable while cotton wool impregnated with ambrine applied to the wound itself causes a burn

(2) On taking off the dressing it occasions pulling and even tearing, since the cotton wool adheres to the wound if it has not previously been covered with a film by the application of a first layer of ambrine as above

To Remove the Dressing —During the first few days the waxen sheath can scarcely be left in place more than twenty-four hours, as lymphocytosis is active and a large quantity of sero purulent liquid flows under the ambrine (which proves that the layer of wax does not adhere to the tissues like collodion to which ambrine to its disadvantage, has been compared), and eventually gathers at the edges of the dressing, where it is absorbed by the cotton wool After a few days this exudation lessens and the dressing can be left in place for forty eight hours or more

To remove the dressing, untie the bandages take off the ordinary cotton wool until the sheath is uncovered This is then cut with scissors and the limb emerges from this mould without the slightest difficulty The dressing comes off as easily as a glove

Next wash the wound with sterile water, and carry out the operation of cleaning by moving over the wound a swab of absorbent cotton wool soaked in sterile water



[illegible] by means of a eminent [illegible] wad of [illegible] not to inhibit the [illegible] d.

[illegible] Granulations—In washing [illegible] solutions [illegible] should not [illegible] water is sufficient There is no need to swab wounds, but just to caress them with a piece of wet cotton wool

The greyish appearance and butyric smell of the wounds when the ambrine sheath is removed is of no great moment It is found, after washing that under the sero purulent liquid the tissues present an intense vitality and an excellent appearance It seems even that the healing elements need for their growth to be bathed in this serum, which produces in a way a real auto-serotherapy

The Luxuriance of Fleshy Granulations—Contrary to what is usually done, exuberant fleshy granulations are never cauterized with silver nitrate or any other caustic In spite of their sometimes considerable development, they are soon seen to be strangled bit by bit by regenerative elements of skin, which end by displacing them In cases of persistent atony or excessive growth of granulations the ambrine treatment can be interrupted every three or four days, and replaced every twenty-four hours by a damp dressing (water slightly alcoholized) The ambrine can be continued afterwards, as the patient will himself request since under the warm sheath he experiences real comfort

After some days of treatment with ambrine there sometimes appears on the healthy skin surrounding the wound an eruption of eudermina, caused by prolonged perspiration under the warm sheath To make it disappear, it is sufficient to cover the skin at the edge with zinc ointment or vaseline sprinkled with talc, at the same time continuing the application of ambrine to the wound

In August 1916 I paid a visit to the Hospital St Nicholas, Paris, where I was given every facility for studying the treatment It was lucidly explained to me by Dr de Sandfort and for several days I was permitted to apply the ambrine to patients most of whom had come from Verdun I found that this required great care and attention to the details already given in order to get the best results On returning to London I furnished a report to the Medical Director-General, enclosing notes and photographs of several patients

In April this year I again visited the hospital and for some days applied the treatment and saw several cases On this occasion Dr de Sandfort himself was not in Paris He had gone to Rome as he informed me by letter in order to establish there the ambrine treatment on a grand scale for the Italian Army and Navy How

ever he was [illegible] kindly received [illegible] Hospital St Nicholas was most obliging in [illegible] visit

The number of [illegible] I noticed was very much greater than last year Dr Dubar's wards were situated above those I had seen Dr de Sandfort use and he had 120 cases under his care In this section of the hospital, I was given to understand that burns were never washed with sterilized water Dr Dubar explained to me that in his experience less scar tissue was formed in this way and he simply removes one dressing of ambrine and replaces it by another every twenty-four hours or more, according to the condition of the burns

One case that I saw received and treated for the first time at the hospital was very severe, extending to the third and fourth degrees over the gluteal region and both thighs It was in a septic condition, and had to be cleansed for three days before using ambrine This was done by applying foments in the form of pads of gauze soaked in permanganate of potash solution of the ordinary strength, covered with gutta-percha tissue and cotton wool It was said however that these preliminaries would not have been necessary if the case could have been treated with ambrine from the start as it would never have got into such a septic condition

Little and in most cases no scar tissue was to be seen as a result of the treatment Some patients, however had been treated by picric acid and other methods which caused marked scarring and even deformity, and they had to be sent later to have the scars removed by serum injection and other remedies The contrast thus presented was striking A case even was pointed out to me in which one side of the face had been treated by ambrine and the other by ordinary methods The ambrine gave undoubtedly the best results

A few remarks on the information I received last year may be of interest in this connection

Dr de Sandfort told me that morphia was not found necessary, as pain disappears when once ambrine is applied I was informed that when large surfaces of the body are injured by explosions extensive burns are often accompanied by pneumonia and suppression of urine In these cases hypodermics of emetina and electrargol are given also champagne with milk diet For suppression of urine hypodermics of serum glucose (100 c c to 400 c c at a time) or theobromine Shock was much reduced owing to the absence of pain but it must be remembered that very many of the cases at the Hospital St Nicholas are not received for

[illegible] April 4 1917 Burns to second [illegible] of the [illegible] left side caused by gas to [illegible]

[illegible]

[illegible] Illustrate The Practical Use of Air [illegible]

[illegible] time after they are burnt My attention was called to [illegible] to small dark patches on the burnt surface, situated amongst the granulations They have been taken for gangrenous patches but are in reality new venous tissue in process of forming, and they disappear in a few days Special care has to be taken in the dressing of all regions of flexion and extension such as the axilla and the popliteal space Granulation tissue is never touched In some cases it was well over a ¼ in in height, but it comes down at once at those points where new islands of skin are forming

On microscopic examination the following conditions are found —

At the beginning many streptococci and staphylococci then number soon decreases and a quantity of leucocytes are seen with a very high percentage of polynuclear cells The new tissue formed is of embryonic type

Burns just received were treated in the same way as those of long standing The blisters are not punctured at first but are covered over with ambrine

The following points are specially worthy of note and are grouped together here —

(1) The dressings are easily applied and removed without disturbing the patient

(2) The pain is much reduced, and therefore also shock so that it is even stated that morphia is unnecessary

(3) The formation of new tissue and the natural process of repair go on uninterrupted

(4) The ambrine and water for washing, as well as the instruments used, are all sterilized no antiseptics are used The treatment is therefore clean and causes no injury to the tissues

(5) As no bleeding or tearing of new tissue takes place during the dressing, the risk of septic absorption is much reduced

(6) The amount of cicatricial tissue and therefore contraction followed by deformity seems to be much reduced I saw two cases in which the extensor tendons of the hand were exposed, and was informed that, as in other cases, granulation tissue with skin would eventually cover these and the patients would have full use of their hands

Dr de Sandfort stated that the first four degrees of burns could be treated successfully by means of ambrine, and from the cases I have seen I judge this to be correct

For the photographs of cases treated by ambrine and here reproduced, I am indebted to Dr Pfuib Médecin Aide Major of the Hospital St Nicholas, Paris

A SIMPLE METHOD FOR MAINTAINING APPOSITION OF DIVIDED NERVES AND TENDONS DURING SUTURE

BY FLEET-SURGEON GENERAL G. LENTHAL CHEATLE, C.V.O., C.B., F.R.C.S., R.N.

I have experienced considerable difficulty in maintaining apposition during the process of suturing divided nerve ends. I found that after application of the first and even the second sutures the divided ends slip from their control (fig. 1) and the empty loop (fig. 1, A) may become twisted.

FIG. 1.—Showing the uncontrolled behaviour of the nerve ends.

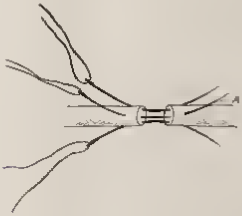


FIG. 2.—Showing the divided nerve ends held in position by the transfixing and catgut bearing needles.

I have designed instruments for holding the nerve ends in apposition during their suture and have had them made with that object, but from one cause or another they failed to meet the case.

I now adopt the following simple and effective plan which accomplishes its object without the aid of special instruments, by

[illegible] of the [illegible] employed in the [illegible] tinal needles and long [illegible] they are all used ready armed with catgut. The curve of a semi-circular needle is too small and gets in the way

The method of their use is as follows (see fig 2) The first armed needle A is passed a diameter's length from the edge of the cut surface of one end to the corresponding point in the other instead of completing the passage of the needle it is left transfixing the ends and acts as a support and hul by fixing the nerve ends opposite each other Then at regular intervals are passed into the nerve-ends four threaded needles which are also left transfixing the nerve-ends as in the case of the first needle A Thus the nerve ends are now immobilized except in the longitudinal direction Then as a rule it is better to complete the passage of the first needle A and tie the ends of the nerve in apposition while they are still held transfixed by the other four needles These needles are treated in turn in the same way when the time for the passage of the last needle has arrived the completed sutures hold the nerve ends in sufficient apposition to allow the successful completion of the operation

The same method could be employed and with advantage for suturing tendons

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SOME PRACTICAL POINTS IN THE EXAMINATION, DIAGNOSIS AND TREATMENT OF CERTAIN FORMS OF DEAFNESS

By Temporary Surgeon WILLIAM IBBOTSON, R.N.

In writing a paper on such a complex subject as deafness I feel that it would be wisest if I confined my remarks to those particular forms of deafness which are especially important from the Naval point of view hoping by this means to assist my brother officers in the diagnosis and treatment of this condition. An experience of nearly three years in this Service has taught me how prevalent is this distressing complaint, and I have come to the conclusion that there is a wide field for research in the prevention and treatment of deafness amongst the officers and men of the Royal Navy.

I have decided to divide this paper into two parts, viz. —

A—Methods of examination of the ear, nose, nasopharynx, mouth, larynx, and accessory sinuses.

B—(1) The ætiology, diagnosis and treatment of certain varieties of deafness with a few notes on the healthy appearances and functions of the several parts of this region.

(2) Suggested necessary standards of hearing for officers and men, with special regards to their particular duties on board a fighting ship.

(3) The detection of deafness in a malingerer.

Paper A is necessary I think in order that I may encourage practical use to be made of the suggestions in paper B.

Paper A.

In all cases of ear, nose and throat disease I have found the following method to be the best, viz. —

Examine in the following order —

(1) Nose.
(2) Nasopharynx.
(3) Mouth.
(4) Larynx.
(5) Ears.
(6) Anterior and posterior triangles of the neck.
(7) Transillumination of frontal and maxillary sinuses.
(8) X-ray of frontal and maxillary sinuses.

Nos. 7 and 8 may be omitted at the discretion of the examiner.

By such a method as this it is practically impossible to miss any gross lesion the finding of which—though it may be unsuspected from the history of the case—may be of the utmost importance in treating the cause or causes of the disease. The quack's methods of treatment are symptomatic and therefore quite unjustifiable—the scientist looks for the cause and is thus becoming more and more successful with his results to a very large degree.

NOSE.—(A) *History.* The following points should be ascertained:—

(1) Obstruction—Which nostril? If both, is it alternating? (Note that patients very often are under the impression that the obstruction is in the opposite nostril to which it really is.) If constant or intermittent. Effect of climate. Time of day of its maximum. Effect of position of the body. (Note that many noses are more obstructed during the recumbent position of the body.)

(2) History of trauma.

(3) Discharge—Which nostril? If from anterior or posterior nares or both? Character—(*a*) Watery. (*b*) Muco purulent. (*c*) Purulent. (*d*) Hæmorrhagic. (*e*) Smell. (Note whether offensive to outsiders or not to patient.)

(4) Headache—Position. Character. Time of onset during the twenty four hours. (Note that maxillary sinusitis without frontal sinusitis, often gives rise to frontal headache on the same side as the lesion.)

(5) Length of time of symptoms.

(6) Etiology.

(7) History of previous attacks.

(8) Previous operations if any.

(B) *Examination.* The following points should be noted:—

(1) External conformation, viz., depression of nasal ridge, deviation, &c.

(2) Condition of septum—Mechanical malformations. Condition of mucous membrane. Ulceration. New growths.

(3) Condition of inferior turbinals—hypertrophy. Atrophy. Ulceration.

(4) Condition of middle turbinals—hypertrophy. (*a*) Œdematous. (*b*) Polypoid. Ulceration.

(5) Condition of inferior meatus—discharge. Foreign bodies. Cystic swellings.

(c) [illegible] middle meatus—discl[illegible] septum and the middle [illegible] ing down the hiatus [illegible] discharge he increas[illegible] ing [illegible] full of the knees for 1 minute or two, and [illegible] be produced by the manœuvre) (Ex[illegible]ation (Nasal crusts to be present) Polypi

If [illegible] impossible to examine any of the above regions [illegible] if it be deemed advisable one of the following methods [illegible] to attain this end viz —

(a) [illegible] plug of [illegible] which has been previously wrung [illegible] bition of [illegible] by per cent ti which a few drops of [illegible] Ibarle [illegible] have been added, into each [illegible] for ten minutes

(b) Spray both of the above solutions into each nostril

Note that the former method is much the best in that spraying brings the solution into contact with areas which do not require its effect, and therefore the risk of cocaine toxæmia is increased

Note that for the next twelve to twenty four hours or even more, after the application of the above solution, the patient will very often, experience a sensation of a severe cold in the head and that this is due to the reactionary congestive swelling and hypersecretion which nearly always follows the application of cocaine and adrenalin

Note that adrenalin chloride should be used very sparingly with plethoric patients, especially those with arteriosclerosis and high blood pressures

Note that a great antidote against cocaine—and some patients are without any evident cause very susceptible to the toxic effects of this drug—is strong coffee which may be given immediately after its application

Note that cocaine and adrenalin cause hypertrophied mucous membrane to shrink up and so one is apt to obtain a false impression of the amount of swelling present This is well seen in the case of adenoids

NASOPHARYNX —(A) *History* (see Nose section) Presence of Post nasal discharge

(B) *Examination*

(1) Posterior border of septum nasi—(a) Swelling (b) Malformations (c) New growths

(2) Superior turbinals Middle turbinals Inferior turbinals—(a) hypertrophy (polypoid &c) (b) Atrophy (c) Ulceration

(3) Superior meatus Middle [illegible] [illegible] meatus—(a) Discharge (b) Foreign [illegible]
(4) Enlargement of pharyngeal [illegible]—(a) Simple hypertrophy (b) Suppuration [illegible]
(5) Condition of roof of nasopharynx—(a) [illegible] (b) New growths
(6) Pharyngeal Ostia of Eustachian Tubes—(a) Note any suppuration or overgrowth of adenoid tissue
(7) Fossæ of Rosenmuller—(a) Note presence of adenoids.
(8) Condition of upper surface of soft palate Note that a tertiary syphilitic ulcer or a gumma may be found here and nowhere else in this region (as happened in a case of mine) and so clear up an otherwise obscure diagnosis

This examination is never very simple and often extremely difficult and sometimes but rarely, impossible

I have found it a great help to keep the shaft of the rhinoscope pressed against the angle of the mouth during examination By this means the instrument is steadied, and more under control also the contact of the shaft with the mouth causes no reflex and detracts the patient's mind somewhat from the movements of the mirrored end

Try to make the patient breathe through the nose with the mouth open If this fail, tell him to take a deep breath, and hold it, but without any strain

In every case keep his eyes fixed upon your head mirror

If this fail use cocaine as follows Either soak a pledget of wool in a solution of cocaine five per cent, to which a few drops of adrenalin chloride 1 in 1 000 have been added and place it first in one nostril and then in the other, and make the patient sniff up on that side briskly Or spray both nostrils with the above solution Either of these methods, if carried out properly render the upper surface of the soft palate anæsthetic

Also spray the oral surface of the soft palate, fauces and posterior wall of pharynx, with a little of the above solution

Do not allow the patient to cough but only to spit and wait until he tells you that he "feels a lump in his throat then examine

Note that in warming a mirror over a spirit-lamp it is a bad plan to heat the metallic side but that the examiner should always turn the mirrored side towards the upper part of the flame

MOUTH.—(A) *History*

(1) Sore throats
(2) Dysphagia
(3) Dyspnœa
(4) Aphonia—(*a*) Partial (*b*) Complete
(5) Previous operations

(B) *Examination*

(1) Tonsils and fauces
(2) Posterior pharyngeal wall
(3) Oral surfaces of hard and soft palate and uvula
(4) Teeth and gums
(5) Tongue

Note that it is sometimes useful, especially in the case of "flat tonsils," to make the patient "gag," and thus expose considerably more of these organs and render any lesions associated with them much more conspicuous. It is a bad plan to depress the tongue hastily when beginning the examination. The depression should be gradual from before backwards; otherwise the patient is extremely likely to "gag," which increases the irritability, and therefore renders any examination of nasopharynx or larynx much more difficult. Especially is this effect seen amongst the officers and men of the Service, so many of whom are lavish cigarette smokers. It is a well-known fact that excessive use of tobacco produces a hypersensitive condition of the mucous membrane.

LARYNX.—(A) *History*

(1) Aphonia (*a*) Partial (*b*) Complete (*c*) Mode of onset—viz., sudden or gradual
(2) Dyspnœa
(3) Dysphagia
(4) Previous Attacks

(B) *Examination*

(1) Epiglottis
(2) Vocal cords—(*a*) Colour (*b*) Swelling (*c*) Ulceration (*d*) Mobility (*e*) New growths
(3) Arytenoid region—(*a*) Swelling (*b*) Ulceration (*c*) Mobility (*d*) New growths
(4) Interarytenoid Region—(*a*) Pachyderma. (*b*) Ulceration
(5) Ventricular bands—(*a*) Swelling (*b*) Colour (*c*) Ulceration.
(6) Ventricles—(*a*) Prolapse
(7) Pyriform fossæ—(*a*) Foreign bodies
(8) Lingual tonsils—(*a*) Swelling (*b*) Ulceration
(9) Vallecula—(*a*) Swelling (*b*) Ulceration

A [illegible] in using a tongue [illegible] angle of the mouth as [illegible] then when the [illegible] mucial region, press the uvula upwards and [illegible] and so gradually incline it that the larynx becomes visible from behind forwards

Remember that the anatomical conditions are reversed thus what is seen in the left side of the mirror is on the patient's right and so on

Make the patient say E E, to bring the cords together and so to test their mobility and powers of adduction

Make him take a deep breath to abduct the cords and so to widen the rima glottidis If the tongue should arch up and so block the view, gently depress it with one finger of the left hand

To cocainize a larynx for examination paint the oral surfaces of soft palate, fauces and base of tongue, with cocaine 5 per cent to which a few drops of adrenalin, 1 in 1 000 have been added, and then a few minutes later the epiglottis and, if necessary the cords and ventricular bands &c by making the patient hold his own tongue out and using the laryngeal mirror with your left hand Painting is better than spraying as by the latter method it is difficult to estimate how much cocaine is being used and also areas are sprayed unnecessarily and so the risk of cocaine toxemia is increased

EARS —(A) *History*

	Right	Left
Deaf	+ or -	+ or
Paracusis	+ or	+ or
Pain	+ or –	+ or –
Discharge	+ or –	+ or
Tinnitus	+ or (character)	+ or – (character)
Vertigo	? Fallen down	? Vomiting ? Direction
Time	?	?
Onset	Sudden, or gradual	Exciting cause

+ = Yes – = No

If one ear has more marked symptoms than the other it would be marked thus One ear ++ the other +

(B) *Examination*

(1) Pinna—(*a*) Confirmation (*b*) Swelling (*c*) Ulceration or any septic lesion (*d*) New Growths

(2) External auditory meatus—(*a*) Inflammation (i) Acute (ii) Chronic (*b*) Swelling (i) Furuncle (ii) Exostosis (*c*) Cerumen (*d*) Foreign bodies

(3) Membrana Tympani (M T)—(a) Color (b) Swelling (c) Injection (d) Perforation (e) Active (in) Passive (iii) Healed (e) Discharge (i) Character (ii) Odour, (iii) Pulsation (f) Granulations (g) Sclerosis (h) Mobility

If cerumen be present it should be removed before further examination of the ear be made To do this use the following method —

Insert guttæ hydrogen peroxide 10 vols, for five minutes, then syringe with either lotio alkalina viz —

Sodii bicarb
Sodii chlorid } ãã—use ʒi ad Oi of warm water
Sodii bibor

Oi lotio Dakin

Note that it is well not to test for hearing for several hours after removal of cerumen or, in fact, after any syringing of the ears

Hearing tests in health (average)—

	Right	Left
Fork 128 vibrations	AC > BC + 35′ H H	AC > BC + 35′ H H
Weber R L		
Watch	—	?

(Note that a standard watch should be used by all examiners)

Speech	1	1
Whisper	1	1

Express the amount of deafness in fractions of (1)

List of Abbreviations to be used in Connection with the Tuning Fork

> — Greater than
< — Less than

AC	Aural conduction
BC	Bone conduction
D	Diminished
SD	Slightly diminished
VSD	Very slightly diminished
MD	Much diminished
VMD	Very much diminished
H	— Healthy (this is a very much better word than normal as there is no such condition as normality)

LIST OF ABBREVIATIONS [illegible] IN PRACTICE WITH THE WHISTLE

LC = Light contact [illegible]

Express the distance of [illegible] in feet and inches

WORDS TO BE USED [illegible] WHISTLE

Right Ear	Left Ear
(1) Tour	(1) Sal
(2) Floor	(2) Sale
(3) Flour	[illegible] Sait
(4) Floe	(4) Soil
(5) Flewer	(5) Seal
(6) Flayer	[illegible] Sil
(7) Flea	(7) Sik
(8) Ether	[illegible]
	[illegible]
	[illegible]
	(11) Seal

Also Figures 2 and 9 for both ears [illegible] expressions suitable to the particular class of work in which the patient is engaged, viz —

(1) Seamen— Oars ' Way nough— Quartermaster ' Messenger " Close B and C decks " Hands fall in Down all scrub and wash clothes " Scran bags open

(2) Engine and Boiler room Staffs— Fire in the port gangway ' Clear lower deck Port auxiliary engine room " Shaft shaft main hatch

(3) Guns Crews— Close up guns crew Forecastle guns crew " 16 deflection right (or left) " 60 deflection right (or left)— 400 up 100 down Ranges—' 5000 '7100 '9500 5900

(4) Signal Staff—' Down K pennant Down Q pennant ' Hoist P pennant ' B pennant

(5) Wireless Staff— B P C D M N / S I V " 45 49, 50 95 28, 22.' 11750 9,500 (195

FORK TESTS TO BE USED IN SPECIAL CASES, IN ADDITION TO FORK 128

Forks—32, 64, 512, 1024 4096 Express these results in the same manner as previously shown in the case of fork 128 Note that low forks are best heard by AC Note that high forks are

best hearing by bone. Always close the opposite ear when testing hearing by means of the above methods.

SOME OTHER IMPORTANT TESTS

(1) Weber (see above)—Used to confirm the above fork tests. Method: Place fork 128 over the middle of the forehead—keeping both ears open—and note if the patient hears the sound more distinctly in one ear, and if so, which ear. Sometimes the fork is heard more distinctly by placing it over the vertex or on the teeth. This test is useful in the detection of malingering.

(2) Siegle's Speculum—Used to estimate the amount of mobility of the membrane tympani and to determine the presence and position of adhesions associated with that structure, and also to determine origin of pus in middle ear.

(3) Nystagmus—The presence of this condition is sought for as an indication of labyrinthine lesions and cerebellar diseases, &c.

(4) Romberg's Sign—Used for the same purpose as in No. 3.

(5) Caloric Tests—Used for the same purpose as in No. 3.

(6) Gull—Used to confirm a diagnosis of otosclerosis.

For a description of the methods of application of Nos. 3, 4, 5, and 6, see my next paper.

ANTERIOR AND POSTERIOR TRIANGLES OF NECK.—(A) *History*.

(1) Pain—(*a*) Situation. (*b*) Character. (*c*) Previous attack.

(2) Swellings—(*a*) Position. (*b*) Previous attacks.

(B) *Examination*. Note the position of any abnormal swellings in these regions—note their character—and any tenderness associated with them. To determine the several regions which are drained by lymphatic glands in the neck, refer to my second paper.

NASAL SINUSES.—Those referred to here are the frontal and maxillary sinuses.

(A) *History*.

(1) Headache—(*a*) Position. (*b*) Character. (*c*) Time of onset. (*d*) Effect of position of the body. (*e*) Exciting cause.

(2) Discharge—(*a*) Character. (*b*) Odour. (Note if offensive to outsiders and not to patient.) (*c*) From which nostril. (*d*) Effect of position of the body.

(B) *Examination*.

(1) Areas of tenderness.

(2) Areas of swelling.

(c) Transillumination [illegible] as follows—(a) [illegible] the frontal sinuses by placing the lamp against the [illegible] beneath the supra orbital ridge and immediately above the internal canthus, in a direction upwards and backwards. In a healthy sinus an area of dull light somewhat trefoil shaped can generally be seen. (b) Examine the maxillary sinuses by placing the lamp inside the mouth and telling the patient to close his lips tightly around the instrument. Look for a semicircle of light immediately beneath the lower eyelids, and then draw down the latter and note if the light shows through these quite clearly or not. In health this light should be clearly visible, unless the bones are extremely thick. If the room cannot be rendered quite dark as it must be if this examination is to be worth anything, the simplest method is to cover the patient's and the examiner's heads completely with a black velvet cloth. Note that all dentures must first be removed. Some sinuses look quite dark or nearly so when there is no inflammatory disease present, and therefore this examination does not always prove confirmatory of a previous diagnosis. Again, I have seen a case that showed a perfectly clear maxillary sinus which itself was full of pus at the time of examination, but this is quite rare, I think. Generally speaking, if one side be clear and the other dark, and especially if a diagnosis of disease on the dark side has already been suggested, this method will greatly help to confirm that diagnosis.

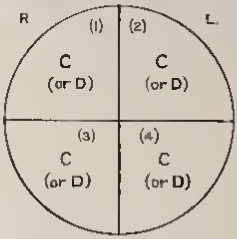
A suitable though somewhat crude lamp can easily be made on board ship, fitted with a 4 volt or 10 volt lamp, which can be worked off the ship's electric current.

The results of this transillumination can be expressed as follows:—

Right frontal sinus, clear or dark	(1)
Left frontal sinus, clear or dark	(2)
Right maxillary sinus, clear or dark	(3)
Left maxillary sinus, clear or dark	(4)

Or diagrammatically, thus:—

C = Clear. D = Dark.



X-RAY OF FRONTAL AND MAXILLARY SINUSES

This is an extremely useful method to employ in every case of suspected disease in the above regions, and I am more and more convinced that it is not made use of to anything like its full extent.

I hope, later on, to show a series of photographs to prove how useful it is. The results can be expressed in exactly the same way as in transillumination.

LAVAGE OF FRONTAL AND MAXILLARY SINUSES FOR DIAGNOSTIC PURPOSES

For a description of these methods I will refer you to my next paper.

The results of examination of the nose, nasopharynx, larynx, and ears, can to a large extent be expressed by diagrams which greatly facilitate the intelligent reading of case notes. They are quite simply and cheaply made. These diagrams will appear in Figs. B.

INSTRUMENTS REQUIRED

For all Regions—

(1) Head Reflecting Mirror—Of 9–10 in. focal length, with large oval opening, with webbing band (or if preferred, with spectacle frame), and as light as possible.

(2) Electric Lamp—With suitable lens, and fitted with a high candle-power bulb, with smoked surface. There are now so many different varieties of these lamps made that it would be inadvisable for me to discuss them here.

(3) Mouth Shield (Ibbotson's)—I [illegible] should protect his mouth [illegible] from the risk of [illegible] it is a duty that he owes to himself as well as to others [illegible] there is often a very great risk incurred during examination of such diseases as acute tonsillitis secondary syphilis, &c., and this shield is designed to meet this risk

(4) Cocaine Spray (anterior nasal)

For Special Regions—(A) *Nose*

(5) Nasal Speculum (either Lennox Browne's or Thudichum's pattern)

(6) Nasal Forceps—Of the many varieties made I find that the most useful are those with scissor handles mounted with phlanges and bevelled blades which are saw toothed at the ends for about half an inch

(7) Nasal Probe (Pegler's bulbous variety)

(B) *Nasopharynx*

(8) Tongue Depressor (Lack's)

(9) Post nasal Mirror (StClair Thomson's) Diameter half an inch

(C) *Mouth* No additional instruments

(D) *Larynx*

(10) Three Laryngeal Mirrors—of different sizes with one adjustable handle

(E) *Ears*

(11) Speculum—Set of three (Toynbee's)

(12) Pneumatic Speculum (Siegle's)—with set of three metal speculum

(13) Syringe (Janet's glass and metal)

(F) *Accessory Sinuses*

(14) Transillumination set

PYREXIA OF UNCERTAIN ORIGIN (P.U.O.) SEEN IN [illegible] DURING THE WAR

By [illegible]

[illegible] the past three [illegible] Malta [illegible] many cases of [illegible] pyrexia [illegible] and [illegible] the Dardanelles [illegible] clinical [illegible] that [illegible] the most striking [illegible] was the frequency of these [illegible] occurring after their arrival [illegible] Very [illegible] obviously wounded case which [illegible] would occur accompanied by [illegible] of symptoms quite incompatible [illegible] application of the wounds [illegible] Many [illegible] finally turned out to be mild [illegible] paratyphoid [illegible] well defined conditions but [illegible] number [illegible] in spite of most careful and [illegible] laboratory [illegible] Occasionally medical officers [illegible] wards and laboratory [illegible] it impossible to harmonize them [illegible] a fact well [illegible] in the early part of the war by [illegible] of Widal reactions [illegible] the titre-agglutination curve [illegible] individual persons had been [illegible] worked out. Apart from [illegible] however which at least [illegible] a diagnosis of typhoid [illegible] very large number [illegible] relegated to the realm of obscurity [illegible] diagnosis of pyrexia [illegible] pyrexia of uncertain origin.

[illegible] this assortment of [illegible] two clinical types, which must [illegible] that a considerable number can be extracted. One of [illegible] was pleichotomus (simply fever) which though frequently diagnosed certainly deserved a larger statistical return than it received, and the other was a ten- or twelve day fever, the symptoms of which were largely of the negative variety and which chiefly resembled the mild type of paratyphoid B.

It is proposed to describe these two conditions in detail, and later to mention the more common (ultimate) diagnosis of cases recorded as P.U.O., with remarks upon each. It is thus hoped to [illegible] at the first line medical officers who either in ships or on [illegible] were only able to see these cases for a few days, and, generally speaking, had no means of bacteriological microscopic or other investigations at their disposal.

SANDFLY FEVER (PHLEBOTOMUS FEVER).

A [illegible] complete account of this condition was given at the [illegible] meeting of the British Medical Association (Section of Tropical Medicine) in 1914.[1] Unfortunately this was not published in the *Tropical Medical Journal* until July 31 1915 when it probably attracted less attention than it deserved owing to the current interest in war surgery. In these papers the relationship of the disease to the sandfly was definitely proved (1) By allowing the flies, after feeding them on patients suffering from the disease to bite non-immune persons and thus producing the fever in the latter, and (2) by producing the disease again by the intravenous inoculation of blood or serum taken from patients in the early stage.

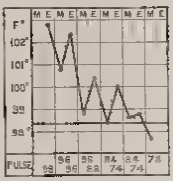


CHART 1.—Temperature chart of sandfly fever showing five days' duration.

of the disease. The incidence of the disease in Malta is roughly from May to October and thus corresponds very fairly to the period of hot weather when sandflies abound. The majority of cases seen (in the naval hospital) are not admitted for this condition but contract it whilst in hospital the reason being that the disease being neither serious nor prolonged can be treated in ships, depots or other units. The symptoms of a typical case are fairly constant. The onset is quite sudden the patient often waking up in the morning feeling shivery (but not in a rigor), with severe headache and pain in the back and limbs. The temperature is raised to

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[1] Phlebotomus or Sandfly Fever: by Colonel C. Birt, A.M.S. Sandfly Fever in China (North India): by Captain G. F. Graham, M.D., I.M.S. Sandfly Fever in Bosnia: by Captain I. W. Houston, M.B., R.A.M.C., and the Bionomics of the Mediterranean Phlebotomus: by Captain F. P. Mackie, R.A.M.C. (Birt Memorial Research Fellow).

102° F or 103° F or less often with 104° F but the pulse is proportionately slow 80 to 90 per minute being common for the first few hours and 70 to 80 per minute the same evening The tongue is coated with white fur and the bowels constipated After the first few hours the headache becomes limited to the frontal region, and is specially marked at the back of the eyes, which are suffused though not watery This stabbing or throbbing pain at the back of the eyes is so characteristic that many patients when asked to show exactly where the pain is located, will place their thumb and forefinger of one hand exactly over the external angular process of each frontal bone This occurs so frequently that it is a sign worthy of consideration in making the diagnosis From the end of the first day progress is usually gradual but steady The temperature may even exceed its initial rise on the second day but the pulse is certainly slower the headache less, and the tongue begins to clean round the tip and edges On the third day the patient feels much better in every way but the evening temperature may be 101° F or 102 F whilst the pulse is probably 70 per minute The tongue commonly shows the white dorsum with red and raw tip and edges at this stage, and the appetite, which previously was very poor or absent begins to reappear The headache is commonly gone but any rapid oscillation of the eyes from side to side is still acutely painful The fourth and fifth days, normally, complete the pyrexia fall and show very mild or no symptoms beyond the fact that the patient realizes that he is much more pulled down than he expected to be The spleen is never enlarged, and no respiratory nervous, or excretory symptoms occur The blood examination is interesting The outstanding feature of it is the increase of large mononuclears up to 7 or 10 per cent Apart from this however in all these cases a considerable diminution of polymorphonuclears compensated for by a corresponding increase of lymphocytes was seen This condition, however, was found in a large number of cases examined in Malta in the summer weather and it was only found to be altered in those cases in which alterations are expected in the normal English blood count, e g, pneumonia &c This question of the blood count will be discussed later suffice it to say for the present that no decision as to the relation of it to this disease was apparent

Such a case as described cannot give much difficulty in diagnosis but, unfortunately mild cases of shorter duration and less marked symptoms are frequent, and even prolonged cases of seven and eight days duration not infrequently occur Colonel Birt, A M S

[illegible] per cent of cases in Malta last three [illegible] whereas of 160 cases studied by [illegible] (India) 50 per cent lasted five days or more. [illegible] the duration of the fever is a common experience. Many [illegible] cases may be regarded as either mild or abortive [illegible] not fully observed from the actual onset. The six and seven-day rises on the other hand are unusually long and after [illegible] and the five day case illustrated above as typical is [illegible] most commonly seen in hospital practice in Malta. The condition is also common all round the Mediterranean in various parts of India and China and other parts of the world. It was thought frequently seen in the Dardanelles and at Salonika.

Ten or Twelve-day Fever.

This heading is merely used as a matter of convenience in describing a condition to which no name seems to have been given but which by a process of exclusion would appear to be a clinical entity. The cases occurred fairly uniformly in summer and winter both before and after the hospital was affected by war work. Some cases were received from ships at sea and some from ships in harbour and shore establishments, whilst several cases occurred in hospital amongst patients admitted for wounds, frost bite, and even neurasthenia. Nothing to suggest an epidemic nature, infection or contagion was observed. The onset was fairly sudden. The patient would feel unwell in the evening with headache, general malaise and perhaps constipation, and on examination his temperature was found to be 101° F. or 102° F. No rigor occurred and further examination revealed nothing except occasionally a little bronchitis. On the second and third days the evening temperature was usually higher, 102° F. or 103° F. or even sometimes 104° F., but the patient's general condition was much the same and rather typhoidal. The pulse, which at the onset was rarely over 100, fell to between 80 and 90 per minute and was lower than this—72 per minute. Bronchitis was the only definite symptom beyond the pyrexia, general malaise and rather drowsy semi-typhoidal state. The tongue was usually dirty and furred but not in any way characteristic, and, when the bowels were well opened and the fever began to subside, it gradually cleaned, leaving a whitish flabby condition similar to that seen in influenza. The pyrexia usually began to fall (remittently) after the third day, but this occurred very gradually, out of all proportion to the rapidity of

constitutional improvement. Thus on the fifth or sixth day the patients often felt quite well and had a very good appetite but the remittent fall would continue and not reach normal until the tenth or twelfth day or even later. No further symptoms occurred. The bronchitis usually cleared up in a week or less, and only the pyrexia and slow pulse remained to show that the patient's condition was not normal. The spleen was never enlarged, and no spots or other

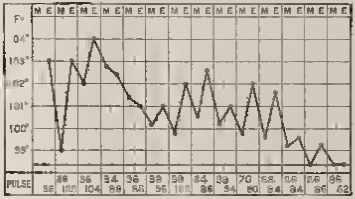

Chart 2.—Temperature chart of ten to twelve days' fever.

rash were seen. After the first few days the drowsy semi-typhoidal condition cleared up, and the patient suffered remarkably little. Beyond the trace of albumin during the early part of the fever, nothing abnormal was found in the genito-urinary system. The blood count showed no leucocytosis or marked leucopenia, but as previously mentioned with regard to sandfly fever and in common with differential counts of many other diseases which did not involve acute inflammation, the polymorphonuclears were reduced and the lymphocytes increased.

Differential Diagnosis.

This was chiefly a question of laboratory investigation until the temperature chart was complete.

Typhoid fever, particularly the milder forms of paratyphoid A and B, was excluded by repeated negative Widal reactions, failure of the blood culture and failure to cultivate the organisms in the stools (*Bacillus typhosus*, *B. paratyphosus* A and B and dysentery organisms were searched for as a routine for the greater part of the

[illegible] These investigations confirmed the negative clinical results viz no enlargement of the spleen, no rose spots, and little or no gastro-intestinal disturbance &c

Mediterranean fever the early stage of which is similar to this condition though more severe was excluded in the same way

Influenza, the absence of rigors, slowness of pulse and feeling of post-febrile prostration were considered sufficient to exclude this disease, especially as cases occurred fairly uniformly in summer and winter

Sandfly fever, beyond the slowness of the pulse there was nothing to suggest that these were prolonged cases of this condition many of the cases occurred in the winter months when sandfly fever is very rare if not unknown

Malaria and other more characteristic fevers (e g , relapsing fever) were easily excluded by the absence of their own diagnostic features

Sepsis was obviously excluded (1) by the absence of leucocytosis and (2) by the fact that many cases showed no signs of any inflammatory focus whatsoever Moreover no cases were ever complicated by suppuration after onset as it infrequently occurs in paratyphoid B

General Differential Diagnosis

Apart from these two conditions which as previously mentioned must have totalled a considerable percentage of cases of P U O many other diseases occurred in which pyrexia was the most prominent symptom and which often gave extreme difficulty in diagnosis

Typhoid Fever —Of all these diseases probably typhoid fever (including paratyphoid F) caused the greatest difficulty This was due (1) to the comparative rarity of the pure conditions prior to the war (2) to the modification of Widal reactions by recent inoculations, and (3) to the modification of the disease due to these inoculations The following example may be quoted —

In the early part of the Dardanelles campaign a large number of mixed medical and surgical cases were received from a ship Amongst the medical cases, in one ward alone there were [illegible] cases of P U O Some of these rapidly showed the three symptoms sufficient for clinical diagnosis viz continued fever rose spots and enlarged spleen, others, however, showed no symptoms of any severity whatsoever (except pyrexia) As a matter of routine Widal reactions for all these cases were taken and all were returned

negative to *B. typhosus* [illegible]. A further report found all the cases positive to *B. typhosus*. In the natural doubt resulting from this it was decided to act upon clinical evidence, transferring the cases diagnosed as typhoid (or para T.) to a special ward and retaining the others. Further my sigmoidoscopy, e.g., blood cultures and stool cultures, were then undertaken and in almost every case (not only amongst these ten cases but later on also) the segregation upon a clinical basis was justified. It must be added that this dislocation of the Widal mechanism was only temporary and that later on when the effects of inoculation had attracted greater attention laboratory and ward work harmonized to a much greater extent. The ultimate conclusions in cases of this kind were that very few cases of P.U.O. which did not show some of the typical symptoms of typhoid fever were proved to be of that nature, and conversely that nearly all the mild abortive or modified cases of that disease gave clinical reasons for suspicion beyond pyrexia. The differential diagnosis between the infections of *B. typhosus*, *Paratyphosus* A and *Paratyphosus* B was very much masked by previous inoculations and though it was frequently attempted clinically bacteriological work gave almost the only certainty.

Malaria.—This disease gave much less difficulty in diagnosis as the parasite was usually found in blood films. In some of the malignant (subtertian) cases however the small ringed form is very hard to find and occasionally the crescent form was the first seen probably a week or ten days at least after the onset of the disease. As these cases frequently run a high irregular pyrexia with fewer or no rigors the difficulty is increased. If however, the rapid pulse, the very large spleen, the severe anæmia and the large leucocytic increase in the blood count (up to 10 or 14 per cent in tertiana) are all considered, typhoid fever should be easily excluded. The disease most resembling this condition was relapsing fever in which the high pyrexia—probably starting with rigor—the large spleen and severe anæmia made a very similar picture. As, however, these cases were very rare and the specific spirillum abounded in the blood films the doubt was quickly settled in the febrile stage. It may be added that the effect of one dose of 4 grains given intravenously in these cases was almost startling. The temperature fell to subnormal in a few hours and no further organisms could be found in the blood. The previous failure of quinine when employed accentuated this effect.

Mediterranean Fever.—Although this condition was rare cases did occur (fifteen or twenty in all) and it had always to be borne in

[illegible] In the later stages of the disease [illegible] [illegible] Part alone was almost diagnostic but in the [illegible] the laboratory claimed a lion's share in the diagnosis In most of these cases the temperature chart for the first ten days was almost exactly like that shown in the ten or twelve day fever type, and after that began the typical "undulant fever" In only one case of this number did the severe joint pains, anæmia and emaciation, with profuse sweating occur to show the typical picture of this condition In nearly all however the prominent symptom of the first ten days were pyrexia, enlarged spleen and bronchitis at once suggesting typhoid fever At this early stage the negative Widal reaction for *B typhosus* gave no information but the agglutination reaction in Mediterranean fever occurs very early during the first few days and this is also the ideal time for blood culture Moreover in at least two cases of this condition a positive Widal reaction with *B typhosus* was given in the second week though no other confirmatory evidence (cultures &c) was obtained The diagnosis, therefore, in the early stage depends largely upon the blood culture and the positive agglutination reaction with *Micrococcus melitensis* which is usually very strong (1 in 1 000 frequently) These remarks apply to various ratings of different nationalities English, French and Maltese for though the last mixed in some families, acquire a certain degree of immunity several of the severest cases were seen amongst them

Tuberculosis —The only abnormal difficulty in the diagnosis of this disease in the few cases which showed no obvious lesions lay in the predominence of other febrile conditions and in the natural proneness to suspect all the conditions mentioned above first In such cases until lesion became obvious a provisional diagnosis only could be made and *that* by a process of exclusion

Syphilis —As in the case of tuberculosis when febrile stages of syphilis without marked lesions occurred the diagnosis was difficult It was probably owing to the difficulties of carrying out continuous treatment on active service that a good deal of tertiary syphilis was seen, and not a few of the secondary febrile cases where pyrexia and headache may be only symptoms In such cases a careful search for healed lesions the presence of generalized slight adenitis (especially a bilateral affection of the epitrochlear glands of the arm in this way), and repeated Wassermann reactions frequently solved the question, and this was confirmed by the results of anti-syphilitic treatment

Dysentery —The cause of pyrexia when it occurred in this

[illegible] stools, [illegible] no [illegible] [illegible] t. At [illegible] such cases [illegible] were attributed to [illegible] but though there could be no doubt about the presence of the organisms and all other investigations proved negative there was [illegible] considerable doubt as to whether the organisms [illegible] the cause.

[illegible] the condition requires mentioning namely the low [illegible] pyrexia which followed occasionally upon any of the diseases mentioned above and upon other conditions also. If the complete chart containing the pyrexia of the original disease was seen this subsequent condition was attributed (probably correctly) to asthenia. When however, patients were admitted with a few or no notes and they were found to run this continued low fever it was very puzzling. Probably a good many P. U. O. cases can be attributed to this cause. There can be little doubt that in the hot weather when this condition occurs chiefly the climate—actually a damp heat—is largely responsible though the manner in which it acts is a more difficult question. This is confirmed by the fact that in a climate like the Persian Gulf, which is much hotter and even more damp, the same condition is more frequently seen and to a much more severe degree.

Differential Blood Counts in Malta

In the remarks upon sandfly fever it was stated that all the cases of this disease, in which the blood was examined showed an increase of lymphocytes at the expense of the polymorphonuclears (this is quite separate from the increase of large mononuclears also noted). Further investigation showed a similar count in many other conditions observed in the summer, and in fact, this was the usual count in diseases in which a leucocytosis or other recognized alteration of the white cells was not expected. At first it was thought that this was due to sandfly fever but when it was found to occur in patients who had never suffered from the complaint and even in the blood of medical officers, sick berth staff and other individuals who were perfectly healthy this view had to be modified. Possibly the causation is (to use a vague term) 'climatic' in origin or possibly it may be due to the poison imparted by the sting of

[illegible] antibodies even when [illegible] treated. The marked degree of immunity from [illegible] suggests that a profound [illegible] The lymphocytes numbered [illegible] per cent, the polymorphonuclear [illegible] correspondingly decreased. There seemed to be a [illegible] in the proportions of large and small lymphocytes.

In conclusion it should be stated that these [illegible] intended chiefly to show the difficulties encountered in the ultimate diagnosis of P.U.O. in Malta. Should the [illegible] discussion or criticism by other medical officers working in the same area, a good purpose will have been served.

SOME OBSERVATIONS ON PHLEBOTOMUS FEVER.

By Surgeon F. E. Johnston, M.B., R.N.

and

Staff Surgeon J. W. Myles, M.D., F.R.C.S.Ed., R.N.

During one year of service at ——— a severe type of pyrexia with a short duration was observed to occur characterized by a high temperature, slow pulse, prolonged convalescence and anæmia, and this condition was not influenced by quinine. This drug was issued daily in 5 grain doses to the ship's company as some malignant types of malaria had been reported. The question arose whether quinine should be given more frequently or not. The types of mosquitoes found in this area were the stegomyia fasciata, culex fatigans and the anopheles. Consequently we determined to investigate these cases and compare their clinical records.

To Fleet Surgeon F. W. Bissett-Smith, C.B., R.N., of the Royal Naval College, Greenwich, we are indebted for his kindness in sending us a report on the blood in these cases.

Climatology.—The disease appears to depend upon a high atmospheric temperature associated with moisture and most frequently occurs between the months of April and September.

Etiology.—The disease is supposed to be transmitted by a species of gnat or sandfly, *Phlebotomus papatasii*, which has been found in Northern Italy, Austria, and the Littoral of the Adriatic. Birt, Gerrard and others have described the disease as occurring in Malta. McCarrison in Chitral. It is also met with in the Persian Gulf. Staff Surgeon Myles has observed a similar train of symptoms in cases at Sheerness which occurred during the very hot summer of 1911 in the months of July and August; examination of the blood in these cases revealed no malarial parasites, but gnats and sandflies are very common there and probably have their breeding places in the moats and dykes so common in that district. The disease is not contagious but is locally infectious through the medium of the carrier. One attack appears to confer an immunity against others, as no secondary infections or relapses have occurred. How long the immunity will last we cannot say. The incubation period is not known.

Symptomatology.—The onset is sudden, perhaps there may be a slight prodromal feeling of weariness. The temperature has generally reached 102° F. when the patient has come under obser-

vation pulse 86 to [illegible] down to 84 after an hour [illegible] The slowness of the pulse in comparison to the high temperature is a characteristic of the disease and is of a great diagnostic value. Frontal headache is [illegible] also pains in the limbs and lumbar regions. All patients complain of intolerance to light and sound. The conjunctivæ are slightly injected. No abdominal symptoms were present, neither was the spleen found to be enlarged or tender. Gastric irritability was absent. The tongue is slightly furred in the centre, the edges and tip being clean. The patients were restless and suffered from insomnia. Some cases complained of stiffness in the back of the neck. The reflexes were undisturbed and there were no signs of cerebro-spinal irritation. Throat symptoms were absent. In all cases profuse diaphoresis was noted, which did not affect the temperature. Generally on the third day the temperature dropped from 101·8° F. to 99° F., pulse 76, and then oscillated between 98·8° F. and 99° F. for a couple of days; in some cases a subnormal temperature was experienced for a few days. A good deal of weakness resulted in these cases. Convalescence was slow and associated with anæmia and anorexia.

Diagnosis.—The condition has to be differentiated from malaria, influenza, dengue fever and cerebro-spinal fever, as some of these cases complain of stiffness of the neck. The most important diagnostic factors are the slowness of the pulse with a marked rise in temperature, an apparent leucopenia, a decrease relatively of the polymorphonuclear cells, absence of the malarial parasites, and finally a fever uninfluenced by full doses of quinine.

Treatment is purely symptomatic. The best results being obtained by the administration of phenacetin and salicylates and diaphoretics.

It appears to us that quinine increases the cerebral congestion and general discomfort of these cases in the early stages. During convalescence the patient requires stimulation and a liberal diet from the sickness, and a course of Easton's syrup was found to be beneficial.

[illegible] PHYSIOLOGICAL ASPECTS OF AVIATION

[illegible] ASPECTS OF AVIATION

[illegible]

[illegible] should [illegible] temper[illegible] Many pupil[illegible] to fly [illegible] brother [illegible] them with [illegible] that in [illegible] inclination to fly [illegible] upon some [illegible] of body or [illegible] he should [illegible] the cause [illegible] Prevalence by [illegible] training [illegible]

Flying is a question of [illegible] well balanced decisive mind and [illegible] of sound and quick reflex actions. These reflexes are (1) visual, (2) auditory, (3) tactile, (4) muscular, (5) balancing.

(1) The visual reflex consists of the impressions carried through the eyes to the brain and from there down to the muscles of hands and feet, e.g., the pupil sees a wing tilted up to the right; this impression is transmitted through the eyes to the brain, there recorded and a decision made which is sent down to the muscles of the hands, and the control lever is pushed over to the right.

The normal time for the visual reflex action to occur is [illegible] of a second. This is the reflex action the most important and the most used by the aviator. It is essential that all parts of this reflex be in good working order. Thus it can be seen how important good vision is in flying. Personally I hold the view that no person should take up aviation unless he has full normal vision in both eyes.

(2) The auditory reflex consists of the impressions carried through the organ of hearing, the ear, to the brain and from there to the muscles of hands and feet, e.g., the sound of the engine

[illegible] through the ear to the brain [illegible] there [illegible] look for a good [illegible] place, land [illegible] transmitted to the [illegible]. The normal [illegible] is next [illegible] all have good [illegible]. [illegible] to the ears and [illegible]. This deafness [illegible] is usually much worse after [illegible] gets [illegible] and expands [illegible] hearing may [illegible] results, e.g. [illegible] should the pilot fail to hear or mis[illegible] when given by the [illegible].

[illegible] are the [illegible] in the skin and [illegible] the muscles of hands and feet [illegible] upon the [illegible] and the [illegible] the effects of the [illegible] of a second.

(c) [illegible] received from the [illegible]. When the [illegible] to the brain and [illegible] to the muscles [illegible].

All these [illegible] if the pilot is physically [illegible] after ex[illegible] a second [illegible] the [illegible] and [illegible] it is to be [illegible] period of flying.

Alcohol is better avoided, and smoking [illegible] which may cause palpitation, faintness and loss of vision. Most aviators smoke too much. Diet should be generous and nourishing, as there is a good deal of nerve strain and wear and tear of the nervous system during this period. Flying when hungry is to be avoided, as faintness may occur in the air. Proper sleep is most important

and eight hours sound sleep in the twenty-four hours [illegible] obtained. Well regulated physical training [illegible] opportunities should be afforded for recreation of mind and body to all pupils at an air station.

With regard to the psychology of flying or the study of the sensations in the air, I have found from an analysis of 100 confessions of pupils of their first solos, as well as a careful analysis of my own sensations, that the mind is so occupied in attention to flying, watching instruments, controls, &c. that fear has rarely time to assert itself at least not enough to disturb their flying. Later on a pupil is apt to become over confident and this must be guarded against. Coolness, level judgment, and quick reflex actions are the secrets of success in flying. The fact that aeroplanes are now so improved and structurally strong that there is little or no danger of anything giving way in the air, should reassure pupils who sometimes are distressed by this thought whilst in the air.

Pupils should always strap themselves in before getting off the ground and they should become familiar with the fixing and unfixing of the belt. Belts should never be undone in the air. Unless belted it is possible in a "bump," steep dive or in faintness that an aviator might fall forward on the control lever with disastrous results. I would advise all pilots to carry a stout knife and a wire cutter in the outside pocket of the flying coat.

Flying Gear.

Safety helmets should be worn by pupils as in the event of a crash they prevent injuries to the head and ears from wires and broken struts. The helmet should fit properly and not be easily dislodged from the head so as to slip forward. The ears must be well protected in front so that there is no rush of air straight across the orifice of the ear. A good helmet has a little roll of leather in front of each ear to deflect the air stream thus enabling the pilot to hear well and also preventing any damage to the ear drum. Goggles should always be fitted with non-splintering glass such as triplex. Plain glass goggles should never be used as in the event of their breaking serious injury may be caused to the eyes. Gloves of leather lined with lamb's wool are the best for warmth and do not diminish the touch. The gauntlets should not be too stiff or wide. It is better to wear the gauntlet inside the coat cuff, the latter being drawn tight by a strap. Close and tight fitting gloves should be avoided.

A soft leather lined boot lined with lamb's wool and thick woollen socks keep the feet and legs warm Rubber boots should not be used as they do not give much warmth and are apt to slip on the rudder bar

The body clothing for flying of course varies for winter and summer No such article should fit too tightly Woollen material is the best as its interstices allow of a layer of warm air next to the skin Leather outer garments are usually worn

Most aviators fly with the mouth slightly open Pupils should see that their teeth and gums are in a healthy state, otherwise any local disease therein is apt to be increased by the cold and rush of air

Should a pupil have to do a height test in the winter a good way to prevent frost-bite—or should the skin be sensitive—is to smear the face and hands with a thin layer of vaseline This prevents heat loss from the skin

There are two forms of air sickness One which is akin to sea sickness and due to the rolling and pitching of the aeroplane in 'bumpy' weather is very rare but now and then one runs across an individual liable to this ailment Of course a pilot by doing steep spirals and 'switchbacks' may produce this form of sickness in a passenger The other form of air sickness is due to height effects and is better named altitude sickness It occurs at heights of 10,000 ft and over and is caused by the rarefied atmosphere and lack of oxygen After passing 6,000 ft the breathing and pulse rate become quicker Over 10,000 ft the cold is extreme slight buzzing in the ears, difficulty in hearing headache fatigue and torpor occur On descending rapidly the deafness and buzzing in the ears become more acute, and severe earache may be felt The headache continues for some time after landing and sleepiness is very marked To guard against these effects when going to great heights, especially for any length of time, oxygen should be carried and inhaled slowly as a preventative

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[illegible] EXPERIENCES OF A SURGEON PROBATIONER

[illegible] BY PROBATIONER W. STANLEY SYKES, R.N.V.R.

[illegible] I managed to get my name inserted in the pass list of the [illegible] and thus obtained the requisite qualification, I applied for [illegible] ance forms for the post of Surgeon Probationer. They [illegible] packet of them and a frenzied week was spent in filling [illegible] birth certificates, proofs that I was not a German, [illegible] magistrates and various other ceremonies.

[illegible] is all one of these papers more not reassuring. One of [illegible] ture and address of a near relative presumably in [illegible] poral resting place for a later message. The Se[illegible] Admiralty regrets to announce the following casualty [illegible] stand like lock from which the following is an [illegible] recent hurt or wounds whilst on active [illegible] Royal Navy [illegible] will receive the same pensions and allo[illegible] and other[illegible] on the Royal Navy would be entitled [illegible] At the time I heard sung at the theatre. Many [illegible] keep Sailor beware. A beautiful song [illegible] the circumstances. A little later a misguided [illegible] Evening Express in by offering to present me with a [illegible] Black and Tan. Lost in the Deep Sea. Some people have no [illegible]

[illegible] weeks after the forms had been returned a long official O.H.M.S. [illegible] arrived containing a sheet of foolscap paper printed in violet ink [illegible] effect that I had been appointed a Surgeon Probationer in the [illegible] Naval Volunteer Reserve.

[illegible] I was not called up for service immediately as facilities [illegible] finishing courses of study. Hence for four months my [illegible] was forgotten until July, when it was apparently decided that [illegible] essary for the continuance of the British Empire and I was [illegible] ship. In the meantime the violet ink document had [illegible] faded. One day I received a note from a recruiting officer [illegible] to fill on yellow paper and ending to the point of brutality stating [illegible] must present myself at 6 — Recruiting Office on a specified day [illegible] with a horrible hour to become a corsair!) In uniform and with a large, official envelope stamped "War Office" in one hand, and a similar envelope stamped "Admiralty" in the other, I went to the recruiting office in question. I hate, but found it impracticable to strangle the author of this outrage, totally satisfactorily as he happened to be a major. However the purpose of the visit was accomplished and the one envelope contained the other.

When I arrived on board my first ship I was a land lubber of the keenest dye, never having seen a warship before, except on a cigarette [illegible] and my sea experience was confined to four cross Channel journeys. In spite of this, however, I soon found that it is my good fortune to have strong guts. So far I have not been sick (and there have been plenty of opportunities during the last five months) rather to

the disappointment of the others who plaintively [illegible] not done to carry a Surgeon Probationer [illegible] judged of unprecedented, in fact almost [illegible] However, I pointed out that if sick, I would [illegible] the best room as anywhere else, and so would [illegible] public than a provider of mirth. They admitted [illegible] their pathetic moans died away.

I found to my surprise that directly I got on [illegible] the title of Doctor — a seven years' antipathy [illegible] only known the extent, or lack of extent, of [illegible] a consolation however to the humble one surgeon [illegible] which is serious enough to be beyond [illegible] treatment is not kept on board but is sent to [illegible]

There are two sheets supplied to doctors [illegible] and a generous supply of surgical dressings. [illegible] supplied with instruments, sutures, needles [illegible] pulse, stethoscope, morphia and sterile [illegible] hypodermic syringe. A Wildey's syringe [illegible] Rogeller with a small sterilizer, ophthalmic [illegible] and iodine are also provided. There is the [illegible] compact little supply of surgical appliances [illegible] ordinary everyday cuts and bruises but in no [illegible] the way of medical treatment. Another [illegible] there is no place set apart as a sick bay [illegible] and treatment take place on the upper deck [illegible] store—so called because anything (except [illegible] which is dark, cold, damp and very small. [illegible] be fetched from the galley in a bucket [illegible] back. When I go over to the depot ship I envy [illegible] who has a consulting room, a sick bay [illegible] with a sick berth staff to assist and [illegible] For me it is a case of all dressed up and [illegible] similar land to mouth existence [illegible] As there is no cabin available I sleep [illegible] stow my gear in an easy [illegible] The cabin that has its disadvantages. In [illegible] the hatch at intervals till the deck [illegible] am lulled to sleep by the monotonous [illegible] from side to side rattling with [illegible] shippers and other odds and ends. [illegible] is a wash out, because the flat is so [illegible] hammock swings so violently that if [illegible] from that rebounds to the rifle rack at the other [illegible] to sleep I then retreat to one of the wardroom settees [illegible] forgot to raise the bunk board and in the middle of [illegible] myself shot off on to the deck with my head in the [illegible] worries.

Official duties are not heavy. They consist of (a) [illegible] ships cousin. The medical work varies considerably. [illegible] days pass without a patient, sometimes there are several [illegible] intervals of about a month. There is a surgeon on of the [illegible] company and at irregular intervals there are lectures on first aid [illegible] the chart

house to four men at a time when they can be spared by the executive officer. These lectures take place of course, during working hours; it would be impossible to arouse any interest in men who were taken away from their "make and mend." They are very elementary and must be so, for the whole course consists of three lectures of an hour each. In that time the essentials have to be explained, leaving out all detail to avoid confusion, and a little practical work with the triangular bandage has to be done. All that can be taught in the time is how to stop bleeding, how to recognize and treat a fracture and how to use the first aid and picric acid dressings. After all that is all that is required for the gun's crew, although the average policeman would look with the scorn of superior knowledge at such a short syllabus.

The majority of the cases on board consist of colds, coughs, cuts, burns and bruises. Constipation is very common owing to lack of exercise and shortage of vegetables, and shortly after commissioning there was an outbreak of diarrhœa which was attributed to the water which was of a very rusty brown colour from the new tanks. There have been two cases of scabies, one of secondary syphilis, one of gonorrhœa (three days after we left the dockyard) and also two cases of impetigo. One man was sent to the depot ship with an inguinal hernia which was on the point of becoming strangulated. A few days after this two patients appeared who thought they'd ruptured themselves. They had not, but had probably been thinking about the other man and used their imagination, like the man in one of Jerome K. Jerome's books, who, after reading a book on medicine, came to the conclusion that he had all the diseases mentioned in it except housemaid's knee!

One or two of the worst cuts needed stitches and then I was thankful for the excellent little glass tubes supplied containing a needle ready threaded and sterilized. In an hitherto it was difficult, if not impossible to get aseptic conditions down in the duffel suit store. Yet cases such as suppurating finger, thrombosed piles, boils and whitlows progress satisfactorily.

Cases of sea sickness, which include perhaps 70 per cent. of the ship's company in bad weather are left untreated as nothing can be done for them. They remind one of the story of the cross channel passenger who asked what he should do if he felt he was going to be sick. The reply was curt and brutal—"Don't worry, you'll do it!" So far there have been no cases of tetanus on board. One man was bit on the ankle by a cable and it was difficult for one with such a meagre experience to decide what had happened, as the first aid signs such as unnatural mobility were useless because the injury was at a joint. However I decided that there was no fracture, which diagnosis was confirmed later by the Senior Medical Officer.

My latest case occurred just after a football match. The patient, a stoker rating, thought he'd put his thumb out. On being questioned, he explained that he had smitten some person in the face. At first I wondered whether it was the referee who had been unsatisfactory, or whether the game had degenerated into a general "circle" till I remembered that he was our goal keeper, so perhaps it was unintentional after all.

The other day there was nearly an accident. The Maltese steward

came to me with "something in his eye," so I gave him some solution pellets of boracic acid and explained to him—fluently, as I thought—how to make up a lotion with them. A little later I heard him talking indignantly to the engineer officer who had asked him what was the matter with his eye. "I got something in my eye Sir and I go to the doctor Sir and he give me some pills, Sir, and he sunked his teeth in an aggrieved manner at this insult to his intelligence. I arrived just in time to prevent him swallowing the pills which he fully intended to do although he had expressed doubts as to their efficacy.

A certain amount of time is now taken up by the "gargle parade." Five men of the lost draft have come from C S M. areas so they muster in the duffel suit store twice a day and gargle with permanganate. As this is an important matter I watch them do it to make certain of it.

My only other duty besides medical work is to censor the ship's mail. It is a thankless and unpleasant business to read other people's letters and is also monotonous and very boring—particularly after a make and mend, or at the week end, or at Christmas, when the output of letters is increased, though the monotony is often relieved by touches of—generally unconscious—humour, pathos and sometimes tragedy.

Spare time is filled in by doing odd jobs for various people—copying out store books and the engine room register, or correcting the "North Sea Pilot."

After reading in this Journal the account of "A Battleship in Action," in which an excellent description is given of the medical organization of a big ship, it seems almost ludicrous to refer to my pathetically small arrangements for action as an organization. In a battleship they talk in terms of stretcher parties, operating tables, X ray apparatus, instrument tables, dozens of stretchers and hundreds of first aid haversacks. On a destroyer we talk in diminutive terms and in units instead of hundreds. For us there is no sick berth staff either trained or improvised, no distributing stations with their elaborate preparations. The first aid bags are eight in number—for the guns, bridge, stokeholds and engine room—and even so small a quantity throws a strain upon the contents of the medicine chests. They each contain roughly three first aid dressings, two picric acid dressings (increased to five for the engine room and stokeholds), about half a dozen bandages and a supply of lint, of which there is abundance. This is really all that is required for the use of the men who after all will not have much time to spare for tending the wounded.

The reserve stores will be split up into two parts, one forward and one aft, and will consist of splints, supplies of cotton wool and lint, the remainder of the bandages, iodine, and above all the precious morphia and instruments. The leaunought clothing and gauntlets, anti gas apparatus and flash helmets and the like are kept ready tied in bundles and labelled, as are also the first aid bags, so that the distribution of them will take the shortest possible time. The distribution was to be done by the stokers fire party after they had shipped their hose. Now, however, owing to having had a new draft of ordinary seamen sent to us there

[1] By Fleet Surgeon L. A. Penfold, vol. iii, No. 1, p. 11.

a spare man on board which was not required by anybody else. He was told off to be my orderly in action and so he will now distribute the clothing and hairsacks. Think of that you who have your stretcher parties, your sick berth staff and your assistants! One ordinary seaman R.N.V.R. is resistant and I think myself lucky to get that! Such are the conditions in a destroyer. Where one would put a group of badly wounded men would be hard to say.

Life on board a destroyer has its compensations, however, in the many little incidents that occur. One day we found traces of a rat in the mess room. It lived apparently behind the lining of the ship's side and at night frequented the drawers in which I kept books and papers. Eventually when it had eaten half a tin of chocolate biscuits, part of the box of first aid (a manual of surgery, a bit of picric acid dressing, part of a [illegible] case and started on "First Aid in the Royal Navy" (and also left other traces of its presence), it was decided that that rat must die. Various contraptions, traps were made with biscuit tins, but with no result. Once in a great sea in very bad weather it was seen on a voice pipe in the wardroom round house. Instantly the stokers set was sent for and shortly after the rat. Nothing happened. The set was most [illegible] and was hurled forth to be replaced by an A.B. with a pair of tongs. Strange to say the rat made no resistance but sat quite still and allowed itself to be picked up in the tongs and dropped into the [illegible]. The only possible explanation is that it was sea sick so much that it could not run away or perhaps it preferred death to life under these conditions.

Another incident which threatened to disturb the serenity of the mess was when in a moment of mental aberration I used one of the mess water jugs to dip a piece of hormac lint for a fomentation. The water was left on the sideboard and afterwards used as part complement of a gin and bitters for an officer. He seemed quite upset about it when I told him!

My time is now nearly at an end. I have applied to be allowed to resign in order to complete my hospital work and soon I shall become one of the despised "exempteds" and my association with the Royal Navy as a temporary member of the R.N.V.R. will be over. I have not been in the Service long enough to be imbued with its spirit or traditions being at heart a civilian of the civilians, but the days spent in the company of pukka Royal Naval officers, who as a class were absolutely strange and unknown to me before, will leave behind a memory—a pleasant memory of good fellowship.

Clinical and Practical Notes

SEVERE EMERGENCY CASES AT THE ROYAL MARINE INFIRMARY, DEAL

By Deputy Surgeon Major [illegible] Rodden

[illegible] B, aged 42, Lance Cpl, Field Ambulance [illegible] Shrapnel wounds, secondary haemorrhage.

This man was wounded in action in France on June 9, 1915. A shrapnel wound was in the right buttock and passed as one bullet to opposite buttock into left thigh. The bladder and rectum were not injured. The wounds were opened up very freely and drainage tube inserted. He was sent to England and admitted into Royal Marine Infirmary, Deal, on July 6. Temperature 101, pulse 100. There was a large deeply suppurating wound in the right buttock behind about seven inches long, extending across the other buttock. Drainage tube inserted. The wound in left thigh in its upper third had not healed, was inches long, very sloughy, and drainage tube leading up to left buttock. These tubes were removed and gauze and dressings substituted. He was dressed in carbolic with hydrogen peroxide and iodol. Light but liberal diet. On July 13 at 1.30 p.m. he had an alarming secondary hemorrhage and flooded the bed from the wound in the left thigh. The sick bath steward of the ward acted with great promptitude and applied pressure and turned a patient out of bed for assistance. The surgeon on duty applied a tight circular rubber tourniquet. I operated at once under general anæsthetic but owing to the sloughy nature and softness of tissues no ligature would hold, even undermining with needle and tying to uncircle bleeding points. The hæmorrhage seemed general from branches of the profunda and terminal branches of the sciatic gluteal and internal pudic. I therefore applied six large artery forceps and left them in position as they controlled the hæmorrhage. The wounds dressed as usual. The forceps were removed in thirty-six hours. All hæmorrhage had ceased except one spot which was still inclined to bleed. One pair of forceps was re-applied and left for further twelve hours and again removed. On July 24 he had another secondary hæmorrhage and the same precautions were taken to arrest it and he was taken to the theatre and I again operated. This time, however, the tissues were in a better condition, and I was able to uncircle the bleeding points with catgut by undermining on a curved needle. This completely controlled the hæmorrhage. No further trouble arose and he made an uninterrupted recovery and was sent to duty on November 4.

At each operation I refrained from ligaturing any main artery for the following reasons:—

(1) If the femoral or external iliac arteries were tied in their continuity it would not control the hæmorrhage from the branches of gluteal, sciatic and internal pudic arteries.

(2) If the internal iliac was tied it would not control the hæmorrhage from the perforating branches of the profunda.

(3) If the common iliac was tied gangrene of the limb was feared, especially in its septic condition

Case 2—Mr G H aged 34, artificer engineer Injury to abdomen—perforation small intestines

At 5 p m on November 1 whilst at sea this officer was struck by a heavy sea and thrown against a cowl ventilator on to his abdomen He suffered acute pain He was seen by a medical officer at 12 p m He had acute abdominal pain and rigidity, had vomited four or five times but no blood He was given morphia ¼ gr On admission I saw him at 3 45 a m and ten and three quarters hours after accident The patient was in great pain abdomen moved fairly well on respiration Rigidity Very acute tenderness in one spot in left iliac fossa Temperature normal pulse 80, good volume and regular Urine specific gravity 1030, and no albumin, no deposits I operated at once and opened the abdomen by the median infra umbilical incision and found a small perforation of the ileum about its centre on the free convex border This was sewn up by continuous catgut, Lembert stitches, in two layers Peritoneal cavity mopped dry, and in all pouches Abdomen stitched up in four layers without drainage Stitches removed tenth day Patient made an uninterrupted recovery and was discharged on December 7 to sick leave.

The tenderness, which was exquisite in the left iliac fossa was the determining point for operation in this case as the patient s temperature was normal and pulse 80, and he did not look distressed although in great pain which might easily have followed contusion of the abdominal wall True he had vomited, but this also might follow a contusion This symptom of acute localized tenderness may be regarded as one following a gross lesion or injury

Case 3—F B aged 23 E R A Tuberculosis—peritoneum, &c

This patient was admitted on August 27, 1916, with diarrhœa and vomiting for five days Previous to this he felt quite well The diarrhœa has now stopped and he is constipated He was in Royal Naval Hospital Haslar, October 1915, for observation T B and states he had fluid withdrawn from his chest Temperature 99 4° F, pulse 100 the abdomen considerably distended resistance but no localized area of tenderness Dulness in both flanks which disappear on altering patient s position Bowels apparently distended with gas Scar on right side of abdomen from abscess opened twelve years ago in Westminster Hospital—appendix No signs in lungs heart normal tongue flabby indented and furred teeth fair looks wasted but denies losing weight Enema given B S O He retained his feeds until 8 p m day of admission, when he vomited six to eight ounces of liquid stercoral matter No change in general condition At 10 p m he was distressed and I decided to operate The stomach was washed out before giving the anæsthetic, and I opened the abdomen in the middle line below the umbilicus between the recti muscles The peritoneum was much thickened, inflamed, congested and bled readily The whole of the intestines congested, swollen, friable and riddled with tubercular nodules Free fluid in the abdomen High up in the small intestine and under the spleen and splenic flexure of colon was a friable and breaking down mass, the size of fist and much enlarged and caseous glands The whole of mesentery much inflamed A loop of the ileum was twisted and adherent about ½ in long and causing acute intestinal obstruction this was freed the small intestines then opened and milked of contents, liquid stercoral matter very evil smelling

[illegible] then sewn up with two layers catgut Lembert stitches [illegible] the kidney hepatic splenic flexure pelvis and abdomen [illegible] dry Appendix normal The patient's condition was so critical [illegible] attempt was made to remove the enlarged glands The abdomen was sewn up by through and through stitches of silk worm gut He was critically ill for three or four days and vomiting continued He was, however kept going with rectal feeds brandy and saline Then he commenced to rise and Stitches removed on tenth day and wound soundly healed He was after treated in the open air as much as possible and made a good recovery He was invalided on October 14 and sent to a sanatorium I have since heard from him that he is at home with his friends in the Isle of Wight and looks perfectly well This case is remarkable as it was not considered possible, in view of the grave lesion complicated with acute intestinal obstruction that he would survive the operation many hours, however he did and the through and through stitches used in closing the wound healed as soundly as if done in layers The opening of the abdomen for chronic tubercular peritonitis is a recognized form of treatment This result in such an acute case is most encouraging

Case 4—G T H aged 25, stoker, renal colonic—right nephrectomy

This patient was admitted on October 27 1916, for wounds in action viz, shrapnel wound of the left foot and left elbow This condition was cured On December 5 he had shivering and continue with pains in the right groin On examination the right kidney could be palpated and felt to be enlarged Rigidity and tenderness over right kidney X rays showed large calculus and many others Urine specific gravity 1018 acid, traces albumin pus trace heart and lungs normal Operation on January 4, 1917, by an incision in the right lumbar region over the erector spine from the twelfth rib down to 4 in of anterior superior spine of ilium downwards and backwards Owing to peri nephritis there was considerable difficulty in separating the nephritic fat from the kidney The kidney than delivered into the wound and much enlarged The whole kidney substance was very thin and cystic, and the lower pole thin as tissue paper The kidney was opened by an incision over its convex border just inside the central line and four large and nine small stones removed The substance of kidney was so thin and disorganized and also contained numerous pouches filled with substance like sand that it was decided to remove the organ The pedicle was very swollen and thickened owing to perinephritis. With some care an aneurism needle threaded with catgut was passed separately around the ureter renal artery and renal vein and tied The kidney was then cut away with scissors and the pedicle again transfixed with aneurism needle and tied whole Two drainage tubes introduced one into suprarenal pouch and one down to the stump Muscles were brought together with catgut skin with silkworm gut, in all eleven large stones were removed, one very rough and star shaped fitting with the calyces Two other smaller ones Some of the stones were buried in the parenchyma of the kidney In addition masses of sand like stones Tubes were cleansed with dry gauze on first and second days and removed on third day Patient made a good recovery and wound soundly healed He was discharged on February 14 The interest of this case is the number, size and shape

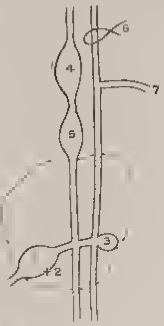
of stones which allowed this man to continue the arduous work of a stoker in a destroyer without reducing the condition and knew near the lower pole of the kidney was to rupture

Case 5—W H G, aged 21, stoker Hydronephrosis—ureter calculus

This man complained on October 24, 1916, of pain in the left iliac fossa and groin No tenderness or rigidity Temperature normal He was admitted on October 31 There was then very definite swelling in the left kidney region which he stated was increasing with pain, rigidity and tenderness, bulging intercostal spaces left side cannot stand erect Heart normal Urine trace albumin Temperature normal pulse normal X rays showed an oval shaped stone the size of pigeon's egg lying obliquely in the ureteral opening in the left side of bladder, and causing acute hydronephrosis Operated, opened the bladder by median abdominal incision below the umbilicus and found the stone This was not free in the bladder but covered with mucous membrane and entirely blocking the left ureteral opening into bladder An assistant had his fingers in the rectum to keep the stone in position and whilst cutting on to the stone it slipped back into the ureter suddenly Immediately a copious flow of urine followed The wound in bladder was stitched up with catgut continuous Lembert stitches in two layers skin wound silk worm gut Drainage in vesical pouch Tube removed in forty eight hours and wound healed Hydronephrosis quite subsided Surgeon General Arthur Edmunds, F R C S R N, on December 29, 1916, again operated as a ray showed the stone still lying in the left ureter low in the pelvis close to but not in the bladder as previous operation He made an incision 5 in long extending from post axillary line downwards and forwards to a point 2 in above anterior superior spine of ilium The peritoneum was exposed and opened The left kidney was found to be enlarged and cacular, but was not considered advisable to remove it Right kidney then felt and found to be normal Following down the ureter intraperitoneally the stone was found deep in the pelvis The peritoneum was now pushed aside and the ureter found extraperitoneally The stone was pushed up to the brim of the pelvis and held between two fingers so that it could not slip The ureter incised and stone removed The ureter then sutured with silk and the peritoneum closed A drainage tube placed in extraperitoneally and the muscles and skin sutured together with silkworm gut through and through figure of 8 fashion Tube was removed on the fourth day The wound had healed on February 4 1917, and the urine normal He was discharged on February 6 The interest of this case is the complete blocking of the left ureter and the rapid development of the hydronephrosis also the failure at the first operation and the slipping of the stone although precautions had been taken to prevent this The stone was very smooth and polished and greenish black like an agate which would account for the ease in which it slipped Surgeon General Edmunds considers the interest in the second operation which he performed is centred in the intraperitoneal operation which most text-books do not advise By this means one is able to follow the ureter readily also it enables one to push the stone upwards and fix it at the brim of the pelvis as done in this case to dissect the peritoneum off the ureter extraperitoneally with greater facility, and to cut down on the fixed stone extraperitoneally Sew up the peritoneum Drain extraperitoneally

[illegible]—L. J. H., aged 22, Private R.M. Brigade. Rifle grenade wound left thigh and leg. Arterio-venous aneurysm.

Admitted June 23, 1916, with rifle grenade wound left arm and thigh. Had been operated upon and wound sewn up. On admission thigh wound outer side much discoloration and thickening. On the inner side a very marked thrill can be felt in Hunter's canal. Anterior and posterior tibial pulse felt very slightly and less than right leg. Circulation in left foot not so good as the right. Urine normal. The thrill increased and on auscultation a loud harsh systolic bruit was heard in Hunter's



(1) Aneurism of popliteal vein.
(2) Rupture of popliteal vein.
(3) Aneurism of popliteal artery.
(4 and 5) Dilatation of femoral vein in Hunter's canal.
(6) Ligature of femoral vein in Hunter's canal.
(7) Varicosities of [illegible].
Both of the false sac[illegible] [illegible] venous popliteal [illegible]

canal. This bruit also heard in popliteal space, but much softer and more blowing in character. Measurements of legs around the calf: left leg 11 in., right leg 14 in. No pulsation in either Hunter's canal or popliteal space. Circulation evidently much interfered with. On July 3 I operated. A tourniquet applied to femoral artery in Scarpa's triangle. Hunter's canal opened up by an incision over the femoral artery and the vessels exposed. Dilatation of the femoral vein in two places with marked thrill in each dilatation also in popliteal space. No aneurysm found. Compressing the femoral artery in Hunter's canal above the anastomotic branch controlled the thrill in the dilatations of the veins

and also in popliteal space The artery was therefore tied here Muscles sutured with catgut Skin united with Michel's clips No pulsation or thrill was afterwards felt in Hunter's canal or popliteal space The foot and leg became gangrenous, and the leg was amputated through the lower third left femur by long anterior and short posterior flap Three drainage tubes inserted and muscles brought over end of bone with catgut, skin sutured with silk worm gut Tubes removed on fifth day Stump healed by first intention He was fitted with an artificial limb at Queen Mary's Convalescent Auxiliary Hospital, Roehampton and invalided on January 23 1917 The popliteal space was dissected up afterwards and also opened up in Hunter's canal There was an arterio venous aneurysm in the popliteal space in the upper part Both the artery and vein were dilated and there was a small rupture in the aneurysmal dilatation of the popliteal vein and the blood had extravasated, surrounded and formed a false sac around the artery and vein Marked dilatation of the femoral vein in two places in Hunter's canal vide diagram

The aneurysm of popliteal artery was small and that of the vein somewhat larger The communication between the artery and vein is complete

In this case the dilatation of the femoral vein was first noticed which guided me to explore Hunter's canal although the aneurysm was present and was not detected at first When the aneurysm was not found and compression of the artery in Hunter's canal controlled the thrill in the popliteal space it was hoped that ligature of the artery in Hunter's canal would have cured the aneurysm Unfortunately gangrene set in and one's hopes were not realized

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A CASE OF ABDOMINAL ANEURYSM

By Temporary Surgeon HENRY E KINGFREY F R C S Edin R N

The following notes on a case of aneurysm of the coeliac axis of which I was in immediate charge are forwarded as likely to be of interest —

J J aged 37 stoker R F R, was brought to hospital in a collapsed condition on March 12 1916, complaining of severe pains in the right lumbar region He gave an interesting history of having been operated on five years previously for an aneurysm in the abdomen by Mr W J de C Wheeler F R C S I in the Mercers Hospital Dublin Examination showed a large pulsating tumour in the epigastric and umbilical regions An old operation scar was visible, just to the left of the umbilicus in the vertical axis and 3 in in length. The tumour itself was tender and dull on percussion, with a marked systolic bruit audible all over the abdomen and extending down into the femoral arteries The heart was markedly enlarged The blood pressure registered S 250 mm D 105 mm There was a mitral diastolic murmur With rest and treatment with morphia and potassium iodide his condition somewhat improved His blood pressure gradually went down and on March 14 it registered, S 150 mm D 90 mm On March 19 his condition became acute, he had attacks of

[illegible] ing [illegible] our enlarged pain bo[illegible] He shewed [illegible] lapse [illegible], was prof[illegible] pulse [illegible] rapidly and [illegible] pon[illegible] to internal hemorrhage Absolute [illegible] thing could be done in the way of operative treatment Hypo[illegible] injections of strychnine and inhalations of amyl nitrite were given [illegible] little avail At 9 o'clock on the evening of March 19, he died A post mortem was asked for and permission granted On opening the [illegible] free blood-clot was found [illegible] adhesions had formed on to the anterior wall of the stomach resulting from the old operation scar The clot chiefly occupied the right side of the abdomen, pushing the right kidney and viscera forward it was situated between the mesenteric layers and the pain which the patient complained of was evidently due to the stretching of the peritoneum There was a large tumour closely associated with the aorta The heart and aorta down to its bifurcation were removed intact; the swelling proved to be an aneurysm of the coeliac axis which had perforated on its right posterior border Further communication with Mr Wheeler showed that this patient had been operated on by him five years previously for an aneurysm of the coeliac axis, when 105 m of silver wire were injected into the sac by means of a Colt's apparatus X ray photograph of the swelling showed the wire still intact and it was interesting to note the thickness of the sac wall set up by the foreign body, ½ in thick This patient was performing the duties of a stoker up to the time when he was admitted to hospital

The dissection of the tumour turned out to be of a tedious and difficult nature but was successfully carried out with the assistance of Surgeon D G Arthur, R N

SOME CASES TREATED BY MODIFIED RAY METHOD SUITABLE FOR SHIPS AT SEA

By Surgeon GEORGE J CARR M B R N

On joining my present ship in July 1916 I inherited from my predecessor a case of an officer suffering from a severe skin disease of the face and neck He had added by scratching a staphylococcal infection and the skin was covered with small ulcers which were very vascular It had been treated for a long period with various unguents with no permanent results and both to his messmates and himself he was rendered obnoxious Stock vaccines were tried of staphylococcal and streptococcal type with no result but no further comments were used

As I had been doing a considerable amount of photography and had found that in the far northern latitudes the actinic value of the light often because of its intensity made it necessary to shorten exposures I surmised that this might be the cause of the continuation of the irritation Therefore a lead mask was made and worn by the patient while on watch

The result was immediate and in a fortnight his face was perfectly clear He told me afterwards that the origin of the trouble had been a severe sunburn two years ago which apparently had never had a chance to heal

At the same time I was treating another patient by sunlight by

exposure of two abdominal ulcers probably tubercular of five months standing This case almost immediately started healing and quickly was cured Here therefore were two cases one caused by the other healed by the same agent It was a case of a good servant but a bad master

On November 19 1916 a steward scalded the external and dorsal aspect of the left foot causing destruction of the true skin It was treated with saline baths and a dressing of carbolic and boric ointments until the slough had separated and a clean, healing wound was obtained

Fig 1 —Apparatus I swing means to protect bed clothes from fire should fusing occur

It had always appeared to me that the dressing and redressing of areas denuded of skin was unnecessarily painful and wasteful of the young epithelium therefore I determined to do without any dressings and simply place the heel and foot under a cage and watch this was done for two days but no appreciable healing took place Then it occurred to me to try the effect of a modified sun obtained by the rays of a red bulb such as is used in the development of photographs It was placed as in the illustration, and there was a remarkable change in forty-eight hours The rays were started on December 1 and he was discharged to duty on December 8 able to bear the pressure of the sock and boot

The time of exposure was twelve hours during the day with no dressing even during the night interval. A thin serous plaque formed over the raw surface which when removed, showed the healed surface underneath. Since that date I have not had opportunity of controlling this result, but have had marked success with two cases of chronic bed sore very filthy and extensive and one of chancre. The former healed without a scar in ten and fifteen days respectively and the latter in four with no induration.

FIG. 3.—Third and last stage 144 hours from start. 12 hour exposure. Small spot left to show control.

I am not in a position to discuss this from a laboratory point of view, and only wish it possible to show that expensive apparatus is not necessary in the treatment by rays of light and that it is evident that the long rays of the spectrum are efficacious in stimulating growth, as well as the ultra violet of which much has been written especially abroad but which are not easily obtainable in ships without considerable expense primarily. An article in January 1917, *Practitioner* by Captain Swanson Hawks R.A.M.C. (Temp.), shows how the "artificial sun" can be used but his methods are not practicable at sea under present conditions in H.M. ships and my results appear in the few opportunities I

have had to be quite as good The patients dread of [illegible] changing dressings is entirely obviated this is in itself a [illegible] source of satisfaction, and the quick return to duty a boon to the [illegible] officer I trust that someone with both material and interest in the service may be tempted to try this method as I have neither nor under the present service routine can I discuss the question with those who are in a position to criticize but results remain as the photographs show

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ICHTHYOL AND ICHTHYOL AND GLYCERINE IN SURGICAL CONDITIONS WITH A REFERENCE TO OTHER METHODS OF TREATMENT OF GUNSHOT WOUNDS.

By Major C W DUGGAN
Royal Army Medical Corps

There is a wide field of inquiry open to all who have the necessary clinical material and care to investigate this subject I shall refer to the more important surgical affections for which I consider ichthyol is specially suitable at the same time mentioning others the treatment of which holds out a prospect of success far surpassing any of the methods at present in use I begin with a brief recapitulation of what I have already written on the subject

Gunshot Wounds—Equal parts of ichthyol and glycerine should be used as long as the wound is septic this period averages three days on the fourth day the quantity of ichthyol can be reduced to twenty per cent The surface of the wound and the surrounding skin should be painted once daily with a camel hair brush and the wound covered with antiseptic gauze absorbent wool and a bandage on no account should impermeable material such as oiled silk be placed over the wound as it invariably delays healing Sinuses should be syringed out at the time of dressing with pure sp vini rectificat drainage tubes cause a great deal of discomfort and should never be used Where the tissues are loose, as in the abdominal wall contraction of the wound takes place at the rate of one inch a week on the dorsum of the foot, and over the shin where there is naturally less play for the osmotic action of the glycerine healing is slower

If after an operation suppuration occur the treatment will always localize and check it one never gets extension of sepsis and secondary hemorrhage and I hope in time to hear that it has also banished gas gangrene and tetanus I am entirely opposed to suturing gunshot wounds at any period this treatment renders it quite unnecessary

In all investigations on wound treatment the two principles of antisepsis and osmosis must ever be kept in mind That this is neglected by most investigators is very evident from the literature on the subject The Edinburgh Medical School have published a large number of cases proving the great antiseptic value of eusol, but in their report no reference is made to osmosis which constitutes so important a factor in the healing of wounds, and in consequence of this neglect recourse is had to the use of astringent remedies to counteract the effects of retaining a watery

[illegible] logged
ties [illegible] ge of dress [illegible]
The [illegible] maintained [illegible]
solution [illegible] cium sulphate [illegible]
beso [illegible] luded of late on account of the [illegible]
exert [illegible] ng the growth of micro-organisms [illegible]
the exp[illegible] tissues these results being amplified [illegible]
ments in vitro In iodi soil pure carbolic acid are [illegible] entific
applications for wounds A very good method for [illegible] wound at
the front is to remove as much dirt as possible by [illegible] vaseline
applied on sterile swabs and the wound is then dressed [illegible] and
glycerine I have not had good results by the peroxide [illegible] I have
omitted reference to wet boric dressing although being still [illegible] used
I think it deserves special notice It has several drawbacks [illegible] I should
like to see it abolished altogether or at least used only for a [illegible]
as a first application suppuration goes on indefinitely under its [illegible]
ings, and frequent changing of the dressing is necessary this throws a
great strain on the hospital staff besides getting through a large stock of
dressings

I have had a strong dislike to medicated baths since I attended [illegible]
chronic or diseases of the skin in the Vienna General Hospital and [illegible]
a case of psoriasis treated with baths, and left to die there I think I am
right in stating that baths are much favoured by the London hospitals
the treatment of phagedænic ulceration but I certainly do not approve of
their use in gunshot wounds the appearance of a limb after immersion
in a medicated bath for some hours is quite sufficient to condemn in this
form of treatment One of my cases of gunshot wound of the hand had
had the part immersed in a bath for forty eight hours during this period
he was unable to sleep the hand was nearly twice the normal size suppurating freely and exceedingly painful

Fresh air and sunlight are no doubt of some use to promote healing of wounds but I think there is a tendency in some cases to overdo the longer this country is not well adapted to open air treatment and I have often wondered why we continue to spend so much money on sanatoria instead of arranging for the treatment of cases of tubercle of lung or sinus in a dry climate such as the Karoo Are the difficulties of transport too great? Would the Colonial authorities object? What percentage of cases relapse after they have left the sanatorium?

I shall now allude briefly to other surgical affections in which I recommend the use of ichthyol alone or in combination with glycerine

Burns —When superficial the combination acts as a sedative and removes the skin congestion when the deeper structures are involved it exerts a very beneficial effect by removing necrotic tissue it is better to dress twice daily in these cases

Bites and Boils —After incision a few days daily application is sufficient to produce a complete cure

Carbuncle —I use the old crucial incision to enable the coal tar to the better to get at the affected part in a fortnight the carbuncle has completely disappeared

Vaccination —If skin infection occurs the whole of the affected skin should be painted over

Conjunctivitis.—Five per cent. to 10 per cent. watery solution of ichthyol should be applied to the inside of the lower lid morning and evening. I have not used it in granular lids. Ten per cent. ichthyol in a case of gonorrhœal ophthalmia caused a complete disappearance of all inflammation in a few days, and the eye remained unaffected.

Gonorrhœa.—The same strengths of watery solutions when used as an injection give very good results; there is less likelihood of a relapse and of complications than with other injections such as potassium.

Abscess.—Lay the cavity open to its full extent and paint on equal parts of ichthyol and glycerine; very rapid healing results.

Dysentery.—Five per cent. watery solution is worth a trial, using two pints at a time.

Ulcers.—Equal parts of ichthyol and glycerine should be used; if the ulcer is callous pure spirit rectificat should be first applied. In some cases it may be necessary to employ pure ichthyol.

Bedsores.—As a preventive pure ichthyol or in combination gives excellent results. Cases of bedsores which have been transferred from other hospitals have healed quickly with the exception of one fatal case of gunshot wound of spine.

External Carcinoma.—After removal of the growth sutures should not be inserted; the wound should be painted daily with equal parts of ichthyol and glycerine, and allowed to granulate. The combination is well worth a trial in cases of inoperable uterine carcinoma.

Tropical Abscess of Liver.—After a free skin incision and resection of a portion of rib if the abscess involves the liver in this situation, I recommend that a drainage tube should not be used, but the abscess cavity injected daily with several drachms of 10 per cent. ichthyol in glycerine. In the epigastric region I have always found the liver firmly adherent to the abdominal wall, and the abscess could be opened without risk of spreading infection. Unfortunately I left India before giving this treatment a trial.

Suppurative Appendicitis.—Here again I can only put forward this treatment tentatively, as there has been no case in this hospital. Equal parts of ichthyol and glycerine should be employed.

Other conditions in which 20 per cent. to 50 per cent. of ichthyol in glycerine gives good results are: Compound fracture, gangrene, adenitis, orchitis, inflamed external hæmorrhoids, middle ear suppuration, and where amputation has to be performed through suppurating tissues.

I hope this short account of the possibilities of ichthyol will stimulate inquiry in the various directions I have indicated. I am confident it will amply repay the labour spent in determining what place this treatment should occupy in surgery and in carrying out this work I only ask medical officers to approach the subject with an open mind and give the treatment a satisfactory trial.

I was very much interested to find that Captain Alderson had obtained good results from this treatment at a divisional rest station in France.

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ACUTE RHEUMATISM PURULENT OPHTHALMIA BLINDNESS

By Staff Surgeon J MacDonald M D R N

The patient was a stoker rating aged 40 who on November 4 1910 had symptoms of acute rheumatism, temperature 101 4° F coated tongue, offensive breath and the right knee greatly distended with fluid The urine was normal There was no gonorrhœa his last attack being in 1905 No syphilitic history After a saline purge the ordinary treatment by salicylates and alkalies was given The temperature rose next day to 104° F and the patient looked extremely ill On the morning of November 9 the conjunctiva of both eyes became inflamed the left more so than the right This condition increased, and large flaky masses of lymph and pus appeared The eyes were at first washed out with warm boracic lotion and atropin inserted but perchloride of mercury was substituted and the irrigation continued every fifteen minutes Still the disease progressed The iris and cornea remained clear until November 13, when some steaminess could be seen and next day there was a trace of pus in the anterior chamber

Nothing seemed to stem the virulence of the inflammation The irrigation was increased from every fifteen to every ten and latterly every five minutes, two sick berth ratings keeping hourly watches and doing no other duties He was awakened twice during the night Silver nitrate was applied followed by flushing with saline solution, and increased the œdema The condition of the right eye resembled that of the left from the onset On November 20 the external canthus of both eyes was incised for ⅜ in outwards to lessen the pressure and provide freer drainage A supply of hydrogen peroxide was also obtained and was the only remedy which had the slightest effect in controlling the discharge It was inserted well under the eyelids by means of an ink filler from a fountain pen, and improvement began at once The irrigation was practically continuous, and as the suppuration lessened, the profuse effervescence caused by the liberated oxygen which at first covered the globe everywhere became limited to the sloughs adhering to the palpebral conjunctiva. Cellulitis had commenced in the incisions at the external canthi but quieted down under the peroxide On November 30 the normal whiteness of the eye showed signs of returning the excessive photophobia became less, and warm saline solution was alone used as an irrigating lotion Meanwhile the general condition had made no improvement The temperature ranged between 99 1 F and 103° F and he sweated profusely On Nov 27 the fluid gradually cleared from the right knee and involved the left one, the right having no fluid three days afterwards There was an extensive sweat rash on the body which he had had for months The heavy smell from the breath yielded slowly to a formalin mouth wash, and the vigorous use of a toothbrush A loose tooth was extracted The patient was greatly depressed mentally but took a liberal supply of milk and soup The salicylates given at the onset of the disease seemed quite inefficacious and after a week were replaced by a mixture of quinine and iron The latter caused digestive trouble and iodide of potash was substituted

The patient was surveyed on December 5 and took passage to Plymouth At that time the inflammation was subsiding in both eyes The sight of the left eye had entirely gone, the cornea having a ground

glass appearance [illegible] being indistinguishable In the right eye there was a clear [illegible] in the centre of the cornea The iris was just visible, [illegible] on of light only remained

At the onset of the [illegible] the limitation of the swelling to one joint naturally aroused suspicion of gonorrhœa There was no urethral discharge and a scraping made from the interior of the urethra failed to show gonococci when examined microscopically The purulent inflammation of the eyes definitely commenced in the palpebral conjunctiva it had some of the characteristics of a rheumatic iritis, the iris only becoming involved after the ocular conjunctiva was affected and œdematous

The question of accidental infection was considered the patient had not been out of bed during his illness and had always used his own towel this he had been in the habit of washing and hanging up to dry in the stokers bathroom No one using this bathroom suffered from gonorrhœa A daily examination of the pus under the microscope showed no gonococci but only a few isolated cocci, a result rather unexpected but confirmed on sending a slide to another ship The diagnosis of acute rheumatism is made with some diffidence Septicæmia might be a more accurate term possibly originating from a focus in the mouth but this was in no worse state than commonly found in lower deck ratings

In cases of purulent ophthalmia in future the writer would be inclined to use hydrogen peroxide at the earliest opportunity and exhibit it to the exclusion of all other well known eye lotions There are some disadvantages however it is expensive, difficult to obtain on foreign stations and extremely unstable in tropical climates even when kept in the coolest part of the ship

The patient's medical history sheet is interesting In 1902 he was sent to hospital with disease of eyes and discharged with the diagnosis of gonorrhœa Four years later he entered hospital with gonorrhœal ophthalmia and returned marked right iritis In 1909 he was in hospital with gonorrhœal ophthalmia and returned to duty after one hundred and twenty five days marked seq of gonorrhœa In 1912 he was in hospital with left iritis and discharged marked septic iritis In 1914 he received hospital treatment for iritis, which is called rheumatic There is a total sickness (excluding the present illness) of two hundred and fifty four days on his medical history sheet from disease of the eyes There is only one entry of gonorrhœa viz in 1905 and the patient was emphatic that he had had no other attack

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AN IMPROVISED CARDBOARD STAND FOR USE WHEN FILLING NARGOL JELLY AND CALOMEL CREAM TUBES

By Fleet Surgeon MONTAGUE H KNAPP R N

As I know by experience that it is almost impossible to fill nargol jelly and calomel cream tubes quickly accurately and cleanly, without some sort of holder in which to stand them while being filled, and as such a holder is not always at hand I think perhaps the following description of how one may be quickly made by anyone on board a ship, may be of use

I should be diffident of describing [illegible] so obvious and simple device but for the fact that I have seen sick [illegible] hastings and others filling the tubes without using something of the so[illegible] and with very indifferent results

Sketch showing inverted box lid with [illegible] board pinned across it and kept in place by two pins making a stand for holding urogolytic and catheter tubes while being filled

Cut a piece of stiff cardboard just to fit inside the lid of the box in which the tubes are supplied—the object of this is, that the card when prepared may be kept for further use inside the box The bottom of such an empty box is all that is required for the purpose being the right size and thickness

Now with a ¼ inch rubber punch which can be borrowed from the carpenter or engineers department, punch as many holes as may be required in the card and place the card across the inverted lid of the box a single pin on each side will fix the card if desired to the box lid and the stand is then complete

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AN EASILY IMPROVISED STRETCHER COT

By Staff Surgeon HENRY COOPER [illegible]

Description—The cot consists of (*a*) An ordinary service hammock with clews and lashings complete Four short slits (AA) are cut in the hammock in the positions shown in fig 1 these are button holed round

Fig 1—Service hammock showing slits and strengthening patches

and strengthened by square patches of canvas (BB) (*b*) a service bamboo handle stretcher (fig 2) to which two triangular extensions of canvas (DD) are added These triangles are stitched to the ends of th

canvas of the stretcher and brought under the iron spreader bars (l l). At the apex of each triangle an eyelet hole and lashing is provided, for attachment to the clew ring of the hammock.

Fig. 2. Bamboo handled stretcher with canvas triangles added.

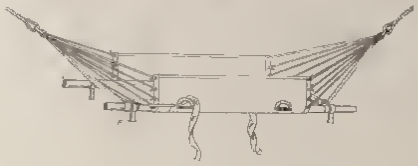

Fig. 3.

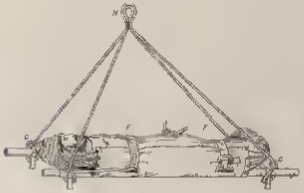

Fig. 4.

Method of Use.—The hammock is laid on the deck, the stretcher is placed upon it, the four outer clews at each side of each end are brought up outside the feet and handles of the stretcher.

The rope handles (CC) of the stretcher are squeezed through the slits AA which should fit closely, and then the outer hammock clews already mentioned are shortened up till the sides of the cot are just tight when the cot is slung (fig 3) The mattress supplied with the service hammock fits this cot

To Secure a Patient in the Cot for Hoisting—The blankets are tucked well in all round and the clews and lashings are brought from either end and tied in the middle or may be secured to the eye of the sling at H Then the shoulder lifting straps (FF) of the stretcher are each passed through the first rope handle of their own side and taken over all to the corresponding handle of the other side (fig 4)

For Hoisting—A simple four legged sling (H) is used which has a running noose (G) at the end of each leg Each noose is passed over the bamboo handle and round the foot of the stretcher The two head end rope legs should be about four inches shorter than the two foot end ones

Advantages—(1) The cot can be made up very easily on board ship (2) it is as easy to carry as a stretcher (3) it slings well as a cot on board (4) the service canvas cot is so wide that it will not enter an ordinary ambulance ashore nor will it enter the doors into the forecastle mess deck of the larger destroyers This cot will do both being only 2 feet wide (5) the cot slings comfortably and safely for hoisting purposes

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HOW TO RUN A SICK BAY

By Staff Surgeon J L BARFORD R N

With so many temporary surgeons and junior surgeons, Royal Navy, in medical charge of ships it may be useful to detail a few hints other than those which are contained in the K R and A I and which have already been expanded upon in this Journal, for the ordering and management of a sick bay Every man has his own methods of course, but it is possible that some of the suggestions herein may be of use

The simplest way of meeting the requirements of this article will be to enumerate such books, forms papers, &c which it is found advantageous to keep in a well ordered sick bay and the first that suggests itself is obviously (1) the Day Book (M 209)

In this, of course is recorded the day s work Suppose a margin be ruled on each side of the right hand page In the broader margin on the left of the page are put the men s surnames, followed outside the margin, by their christian names, ages ratings, &c If the man is on the sick list his surname is *underlined* The names of mere visitors, birds of passage, as it were are left not underlined but it is well to take the full names, ages ratings &c in *all* cases It sometimes happens e g, in venereal cases (which should all be primarily entered in the Day Book) that a man is placed sick momentarily as it were The surname is then underlined as usual although the man is at once sent to duty In the narrower right hand margin it is convenient to record the diet and extras on which the patients are placed and such details as to whether he is to be allowed his rum or not Along the left hand margin may be indicated by a big 'C' or 'H whether a patient is placed in cot or hammock

The left hand page of the Day Book is reserved for daily remarks on meteorological conditions (which remarks the sick berth staff should obtain weekly from the bridge), for recording special examinations of patients and their weights, and for records of examination of urine, water milk &c

At the end of each morning's visit the number of sick for the day and the number victualled in the sick mess should be recorded If a man is subsequently placed sick, the *time* at which he is first seen should always be noted This is particularly important in the case of accidents Men placed sick after the morning visit are generally victualled "usually" i e on such provisions and comforts as there may be in the sick bay

The index pages at the beginning of the Day Book should be kept up to date by the sick berth staff as they much facilitate the finding of a given man's name in the book

At the end of the Day Book the sick berth staff should be instructed to make copies of all the cases of men sent to hospital, of hurt certificates, and sick bay communications generally

Finally, the Day Book should, for tidiness sake, be covered in duck or jean, and it is invariably the best plan to have it kept in the medical officer's cabin the sick berth staff copying daily on a slate perhaps the patient's treatment and other instructions If the Day Book be left always in the sick bay patients are apt to take too lively an interest in it

In a big ship it is often convenient to have—(2) an Officers Day Book a pleasant leather covered notebook, for example, as well as the general one This is of course, of a private nature and should not be entrusted even to the sick berth staff Such a book would not prevent the names of officers being entered in the general Day Book for statistical purposes

(3) The Attending List Book is next to be considered One of the Service Prescription Books (M 195), may be conveniently used for this purpose On the left hand page are entered the men's names and complaints and on the right their progress and treatment The names of men placed on the attending list are put from the Day Book into the Attending List Book by the sick berth staff after the daily visit The whole of the attending list cases are passed in review twice a week, say on Tuesdays and Fridays, except such cases as chronic syphilitics and men under observation for tuberculosis &c, who may be seen on Fridays only for example

After some experience it has been found better to have an light duty list Such a list the men on which are "betwixt and between," tends itself to abuses and is not really worth while let a man be either on the sick list or not But an Excused List Book (3) may be kept and in this may be recorded the names of men excused boots, boat pulling, doubling and so forth In Depots and Training Establishments, excused list attending list and light duty list cards of different colours are issued to men They keep such cards in their caps and produce them on every attendance They are very convenient in a large establishment but unnecessary in a ship If an excused duty card is given out the date of its issue and expiration should be entered in the Excused List Book

Next may be mentioned (4) the Medical Officer's Daily Sick Book (M 195) in which are recorded the names and particulars of all men on

[illegible] It is as well to put the names of *all* men who [illegible] though it be for only one or two days or perhaps [illegible] of venereal cases only momentarily This book is useful [illegible] ing the nosological return at the end of each quarter [illegible] thought unnecessary to record in the nosological return the [illegible] sick with quite trivial complaints for only a day or so and such [illegible] are lined through in the Daily Sick Book This proceeding although I suppose irregular is convenient and appears harmless The Daily Sick Book is supposed by regulations, to be presented to the Captain [illegible] the daily report is made

It is customary to report the sick list daily not only to the Commanding Officer (this is done by the Senior Medical Officer in [illegible] more he carried) but also to the Commander or Lieutenant [illegible] forms are supplied by the Service for this purpose and often so [illegible] ruled and uniformly clean of paper are used At no great [illegible] expense very convenient forms (6) may be bought and certainly [illegible] dignity to the report —Sick List Form B as printed by [illegible] Thorn and Millar of Devonport is a very convenient one and meets all requirements

As regards (6) the Prescription Book M 194 In the [illegible] for the information of the sick berth attendants responsible for [illegible] dispensing and for convenience of reference by the Medical Officer copies of prescriptions of stock medicines and also such special [illegible] as the medical officer may from time to time devise The [illegible] pharmacopœia is most convenient for the dispensing of [illegible] generally employs such drugs as are supplied in the Service [illegible] It would be convenient if this pharmacopœia were regularly [illegible] on ships sick bay on first Training stores on commissioning [illegible] Medical reference sake to keep special prescriptions separate [illegible] old Sick Book for example, and in all cases where a special prescription [illegible] should be entered in book the date and the name of the patient [illegible] prescribed should be entered

It is next convenient to mention the alphabetical books [illegible] formidable to keep In a small ship one such book [illegible] will hold the necessary particulars The book is M [illegible] pages and alphabetically arranged On each leaf (7) [illegible] in alphabetical sick list book [illegible] such as [illegible] heading, reference and by compiling the alphabetical [illegible] alphabetical journal Columns should be ruled just as they [illegible] the journal alphabetical for name age number [illegible] number of days sick [illegible] and [illegible] of Number of Case in this Journal [illegible] column Number of page in Day Book It is [illegible] in case the same man goes sick [illegible] conjunctivitis all a man's periods on the sick [illegible] correctly the official Journal

A [illegible] book (8) contains a nominal roll of [illegible] ship Such a list is obtained from the ship's [illegible] kept up to date from time to time [illegible] on the [illegible] page for number on ships book [illegible] rating date of last vaccination [illegible]

vaccination On the right hand page columns should be ruled for weights (with date) chest examinations (with date) and remarks The weights and chest examinations columns are subdivided to provide for several weighings and examinations For by K R and A I Addenda Article 1301 the weights of all officers and men under 36 years of age are to be taken once every quarter by the physical training instructor and reported to the medical officer and a thorough examination of all men's chests is to be made and recorded as soon as possible and from time to time In the remarks column may be entered particulars regarding extraction of teeth or a big T V may indicate that a man is or has been under venereal treatment &c

A third such book (9) is the medical history sheet book Thus, again, [illegible] a nominal list of all men with columns number on ship's books [illegible] rating and particulars as to medical history sheet which [illegible] received in the sick bay when applied for to previous ship, [illegible] parted with on a man's going to hospital or otherwise leaving the [illegible]

As regards medical history sheets generally they should, of course [illegible] kept in a safe place A large number of men now serving, [illegible] R N R R I R and pensioner ratings bring no medical sheets [illegible] other serving papers The same is often the case with [illegible] R N R [illegible] and medical history sheets of these men should always [illegible] to their previous ships or depots Having no properly [illegible] and labelled medical history sheet cupboard I have found it [illegible] to keep them in guard books, obtainable at the ships offices, [illegible] book contains the medical history sheets of R N (active [illegible] ratings another those of R N V R ratings a third those [illegible] ratings and a fourth those of R N R R I R and pensioner [illegible]

[illegible] the medical officer may keep, besides the Day Book a [illegible] Book (10) containing cases of officers and men of special [illegible] 11) a special venereal case book with full details as to the [illegible] treatment of all venereal cases

Next may be considered books in connection with the sick mess [illegible] rules in the K R and A I referring to the formation [illegible] Nos 1272 1273 1274 1689 and 1690 In practice, [illegible] the sick may be said to be drawn from three different [illegible] through the Paymaster via the ship's steward (standard rations [illegible] tinned milk tea and the articles enumerated in [illegible] 1273 (from the wardroom messman or officer in charge (fresh milk [illegible] butter eggs hunt &c) (c) from the wardroom wine [illegible] soda water &c) For (a) and (b) the sick mess account book (M 1 G) should be used (12 13) The ship's steward and [illegible] may or may not keep duplicate account books for their own [illegible] As regards (c) the sick mess is allotted a column in the [illegible] books and the debts incurred are settled with the money obtained from the Paymaster for the sick mess receipts being [illegible]

A third Sick Mess Account Book (14) should be kept In the credit (i e the money some £5 or £10 as a rule received from the Paymaster as requisite) and debit (i e , money due for standard rations or paid to

wardroom mess for provisions or wines or spent on washing drugs &c.), accounts are kept. This is balanced when the Extra Fresh Diet Sheet (S 16) is made up, which is done in duplicate, quarterly or more often if necessary.

As regards diets for the sick, those laid down in K R and A I, Article 1273 are sufficiently liberal, but it must be remarked that no butter is allowed. If one may criticise, it is somewhat unnecessarily meticulous to limit the daily ration of sugar to 14 drm. and that of tea to 3 drm. Why not allow 1 oz. and ½ oz. respectively and have done with it? The provision of 24 drm. of "pot herbs" too is somewhat vague.

It is convenient to have an amended or amplified diet, such as the following, placed in a conspicuous place in the sick bay, typed on a card perhaps —

Milk diet	Milk 3 pints
Slop diet	Milk 2 pints Beef tea or bovril 1½ pint Tea ½ oz. sugar 2 oz.
Low Diet	Milk 1 pint Beef tea or bovril 1½ pint Rice or custard pudding Bread, 1 lb Butter 2 oz Tea, ¼ oz Sugar 3 oz
Full diet	Beef or mutton ½ lb Potatoes ½ lb Greens or other vegetable ½ lb Bread 1 lb Butter 2 oz. Tea ¼ oz Sugar 2 oz Rice or custard pudding

N B One tin of Swan's condensed milk makes 2½ pints of milk. For 1½ pint 1 beef tea 1 lb of beef should be drawn. For a rice pudding ½ pint of milk and 1 egg should be used. Eggs, stewed fruit, bovril &c. are often ordered as extra.

It has appeared to me a mistake to stint the sick in any way whatsoever on the plea that the sick bay should not be made too attractive. The medical officer should feel himself incapable of being imposed upon by malingerers and at the risk perhaps of consenting an unworthy patient a sick bay should be made as comfortable as it possibly can.

It is as well to visit the sick bay frequently at meal times to see that patients in cots and hammocks are being comfortably fed (the sick berth staff sometimes do not sufficiently appreciate the utility of feeding cups) and that the table for up cases is decently laid, with cruet, water tumblers, tablecloth &c. The last mentioned article is often found far from clean, or is dispensed with altogether.

It is regrettable that the sick berth staff have to feed more or less with their patients. If possible, a separate little table is convenient and appreciated. Bed tables if not provided, can be made on board for the cots.

(15) The form, M 187—daily account of number victualled in the sick mess—is installed daily by the Medical Officer and by the Paymaster. It is more of interest to the ship's office than to the sick bay.

As regards the issue of rum to the sick, there is a special book,

S 76b—the Spirit Stoppage Book (16) This is written up daily by the sick berth steward and passed on to the ship's steward for his information and guidance Here, again, I think that a certain latitude may be allowed It is too often the custom automatically and without question to dock a man placed sick of his rum Of course, every medical officer will hold his own views on the subject but I venture to hint that there is really no reason why a man with a bit of a cold or a simple injury should so often be made to forego the tot to which he had become habituated

As regards sick bay washing—a Washing Book (17) should be kept in which is entered lists of articles sent to the laundry with prices charged—a duplicate list accompanying the soiled articles, of course When as is often necessary, washing is done on board by a lower deck dhobeying man particulars should be entered in this book also the man who does the washing signing the book for payment received as well as giving receipts to be handed to with the extra fresh diet sheet By a recent order (Admiralty Weekly Order 104 of 12/1/1917) a scale of rates payable to naval ratings for such work is laid down

There are next to be considered a couple of booklets which it is useful to keep in relation to the ship's annual account of medical stores (M 177) These are (18) a Loan Book in which is entered a list of articles and gear issued outside the sick bay i e mainly to officers, with name of borrowers and dates of return In this book too, may be entered a list of the Medical Officer's private gear which he may have to use in the sick bay The other (19) is the Breakage Book in which is entered particulars of articles broken in the sick bay columns being ruled for article broken by whom date and cause This is ruled for coupling Form M 189 which must accompany the Medical Stores Account Book

A few odd booklets or records which it is advisable for the official journal or other purposes to keep still remain to be mentioned viz —

(20) A Record of Attendance at First Aid and (or) Hygiene Lectures

(21) A Record of Attendance at General Quarters and other evolutions such as "abandon ship" in which the sick bay takes a part, with details of routine to be observed

(22) Particulars (date, place where and number) of Preventive Outfits issued

(23) A list of Drugs or Articles that it is desirable to demand or purchase at earliest convenient opportunity This is especially convenient in ships that are isolated from civilization for lengthy periods

One more purely optional book (24) is the Sick Bay Order Book in which are entered orders for the sick berth staff as regards the general routine to be observed in the sick bay orders as to teeth cleaning, bathing of the sick, clothing of cot cases airing of bedding, ventilation of sick bay meal routine, &c

In connection with the above I would humbly impress upon my colleagues the great importance of inculcating to the men under treatment in the sick bay ideas of general and personal hygiene The sick bay staff cannot always be relied upon to see (a) that the sick clean their teeth night and morning (b) that frequent use be made of the cot bay bath (it somewhat often appears more for show than utility) (c) that heavy drawers &c, are not worn continuously by men in cots

eight and lay (*d*) that the sick bays and bedding are well aired at frequent intervals (how often does one see a cot laid open properly for any length of time?) (*e*) that really ill men are properly washed and nursed and that such little details as goose necks feeding cups spittpots &c &c are provided

And I may I here presume to draw attention to the condition so often observed as regards clinical thermometers and less commonly, tongue depressors The thermometer is often put in carbolic lotion contained in a small tumbler or similar utensil into which a mass of wool has been thrust The result is that only about the lower inch of the thermometer is immersed in the carbolic Three inches up one too often finds a collection of mucus and sordes, which may or may not be usually wiped before the glass is used again The remedy of course is a deeper utensil and far less wool

The above list more formidable on paper than in practice more or less exhausts the tale of books and records necessary or convenient to keep No detailed mention has been made of such official forms as the official journal itself (M 179, 180 181), the quarterly nosological return (M 178) (which is best made out in duplicate the second copies being kept for compiling the yearly nosological return in the journal) and many others of those printed forms and books mentioned on the last page of the demand for medicines, form (174 S A)

In conclusion and in some trepidation, I propose to mention a few disabilities under which the sick bays of ships sometimes labour and some 'tips or expedients for their amelioration

In this sick bay of so modern a ship as the Monarch one noticed (four years ago, improvements may have been introduced) that the ship s side was not lined that the cortholes was not shellacked that there was no nayphone and no clock! By a recent order I see that the sick bays of the largest ships are at last considered entitled to a clock

No suspensory bandages are supplied They would be of far more use as a rule than are trusses I remember that in a gunboat with a ship s company of eighteen I had two dozen trusses on charge

No eyeshades are supplied It is somewhat undignified to have to improvise these from cardboard lined with green medicine labels A supply of single and double shades would be a great convenience and involve no great cost

No weighing machine is supplied It is to say the least of it unscientific to have to weigh the sick on the butcher s scales which are very difficult to adjust in a rolling ship and not I fancy particularly accurate

The supply of a small sterilizer say 8 in by 4 in to ships that are not provided with an electric sterilizer would be most convenient for small instruments syringes, &c and should soon save its cost in methylated spirit

The want of lozenges (pot chlor formalin &c) is often felt and would be a welcome addition to the scale of medicines for all ships

The need for pituitary extract for the treatment of shock has recently been repeatedly mentioned by medical officers who have had experience of action

Paraffinum molle is at present supplied in surprisingly inaccessible tins so that there is a likelihood of considerable wastage

The commencement of a supply of forms for the daily report of the sick to the commanding officer and for posting on notice boards &c has been already mentioned

A few old cyanide gauze tins should be kept. One is useful to hold scraps of gauze suitable for collodion dressings. Another forms a good receptacle for string. Others may contain vaseline or other dressings in the engine room.

Nickel shaving soap tins, with the lids perforated make useful dusters for iodoform and other dusting powders.

Empty mustard or glycerine pots make useful receptacles for iodine solution for use in amputation, a stick and brush being fitted.

I have in emergency made the (old pattern) swimming collars serve as stomach warmers as ice bags and combining two, as air cushions. In this connection I cannot refrain from mentioning a tip that I gleaned at an out of the way hospital in Portuguese East Africa. The medical officer aware of the perishable nature of rubber in the Tropics, employed pigs bladders as ice bags. I have myself tried the expedient with satisfactory results.

One more notion the point of which medical officers may or may not be able to impress upon Executive Officers. In these days of possibly inevitable overcrowding in ship depot and camp anything that minimizes the risk of direct throat infections such as measles scarlet fever C S M &c. is worth taking into consideration. At present it is the invariable custom to place hammocks and beds head to head so that adjacent occupants breath cough and sneeze directly into each others faces. I submit the idea of having men so arranged that they lie *alternately head and feet*. Thereby instead of only a few inches perhaps a space of several feet must be forced intervene between any two mouths. Infection cannot obviously be spread by the act of coughing on to another from a distance and the alleged unpleasantness of the arrangement is an example of somewhat unsavoury humour.

In conclusion I hope I may be forgiven if I have appeared dogmatic and I wish to acknowledge indebtedness for many of the suggestions herein contained to the late Fleet Surgeon P Nix and to Fleet Surgeon Lethy Brown from whom I learnt much as to the methodical ordering of work by.

Extracts from Official Journals.

[illegible] Surgeon G. G. Bonnell writes on Protection of [illegible]

[illegible] wool has long been in use to protect the [illegible] On the other hand it has small [illegible] so that ordinary sounds are not so [illegible] [illegible] protectors have been devised. [illegible] Elliott's ear protector is composed of [illegible] and the Mallock Armstrong [illegible] fine wire gauze [illegible] all those devices are more or less [illegible] On the other hand they are expensive [illegible] the exception of the Mallock Armstrong [illegible] hearing.

In June 1881 the Admiralty issued [illegible] wool to [illegible] Battle Squadron for trial. For some reason [illegible] report was made though the Lord Nelson [illegible] squadron, reported favourably. (The [illegible] was [illegible] divided only in one direction, so that it was easy [illegible] into small lengths. Messrs Down Bros have produced [illegible] wool to bring easily in any direction.)

I am myself so convinced of the [illegible] of [illegible] action against gun blast that I have continued to [illegible] [illegible] bite has taken place with the result that I still [illegible] suitable all round form of ear protector yet suggested.

[illegible] this wool forms a self-closing compact [illegible] each placed and kept at entrance to the [illegible] should be torn off and turned out to form a [illegible] [illegible] the form of the conchs a portion being passed [illegible] the outer antilingual part of the meatus. [illegible] without discomfort the whole [illegible] four hours. [illegible] sounds are easily heard, and even [illegible] telegraphy [illegible] efficient.

Fleet Surgeon R. St. G. S. Bond writes advocating the use of Spray Baths on board —

Having had opportunities of seeing the system of spray baths adopted in some public institutions notably that of the London County Council Asylum at Epsom and having consulted with the Captain and principal executive and engineer Officers of the ship who agreed with the practicability of its application it appears to me that this system—of which the following is a brief description—can be adopted on board H.M. Ships with very great benefit as a means to overcome the many disadvantages of the present scheme of bathing arrangements.

The Bath room.—This should be so located as to be near to the mess

[illegible] is intended [illegible] for example, the stokers bath room should [illegible] [illegible] lined up [illegible] [illegible] cupboard and preferably should [illegible] [illegible] attached [illegible] which should then communicate [illegible] [illegible] It should be well lighted and well ventilated, with full [illegible] supply and exhaust [illegible] to carry off steam to the outside air [illegible] It usually conduces to comfort to fit the spray room and the dressing room with warmed by radiators (steam or hot water) but perhaps in ships and between decks this would not be required

The Deck —This should be of concrete. Tiles are liable to become loose and water may soak under them and be retained It should be well sloped to the side of the ship the slope becoming more acute near the side and to an open channel or waterway for efficient drainage

Compartments —Along the side of the ship compartments should be provided varying in number according to the size of the bath room—six [illegible] a convenient number They should be open to the front and [illegible] one side of plates of steel with a beading round the edge and [illegible] rivetted over The width of each compartment should be 3 ft [illegible] [illegible] should project 3 ft 6 in from the ship's side, and be [illegible] in length A inch steel plate should be cut off at the header and [illegible] so that the water can freely run away to the channel Each [illegible] should have a small seat made of teak fixed to the side of the [illegible] [illegible] mats or better still rubber mats should be supplied to the compartment and also some for the general deck to prevent [illegible] to the feet

Sprays —Two sprays with fine roses should be placed at about 7 ft from the deck above each compartment and at such an angle that the man standing underneath has the water falling on each shoulder shifting his position if he wishes it on his head or less The sprays spring from a delivery pipe along the length of the compartment There is a control stop cock on the delivery pipe at its proximal end but each set of sprays should have a separate stop cock of the balance lever type to prevent waste when all the compartments are not in use It would also be a great advantage if arrangements could be made by a separate cock for an individual man to obtain a cold douche after bathing if he so desired

The Mixer —This is the essence of the scheme for the supply of [illegible] It is a mechanical apparatus by which steam is passed into the cold water supply and is a vertical cylindrical thermostat To this a pipe conveys the cold water and another pipe conveys the [illegible] steam the latter warms the water and by the expansion of a metal rod operating on a disk at the top of the mixer, the steam is automatically cut off the instant the water reaches a given temperature [illegible] regulating screw at the top of the mixer this given temperature [illegible] to whatever instructions are given to the engineer Officer [illegible] temperature of 102° F at the stop cock means that the spray is [illegible] to the man at 100° F, but perhaps 102° F or 103° F from the [illegible] would be more comfortable and this could of course be arranged [illegible] There is a cistern over the middle spray for cold water to ensure [illegible] delivered at a constant pressure and this is essential and would [illegible] also for a cold douche, the steam being turned off The mixer [illegible] enclosed in a box with a glass panelled door, the key of which

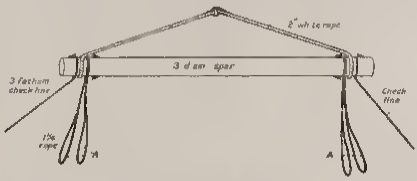
should be in charge of the engineer Officer, otherwise the men get to know how to use the regulating screw and alter it to produce fancy temperatures

To sum up, the advantages of this scheme are (1) extreme speed in bathing (2) each man has his own water supply (3) great saving in water (4) great saving in soap (soap powder or shavings could be supplied) (5) great saving in space required compared with that for ordinary slipper baths (6) detection of skin affections and other diseases for instance by petty officer instructors who should be trained to observe and know what to look for The mixer can be obtained from Messrs Royle and Co , Engineers Manchester

Fleet Surgeon G G BORRETT writes with regard to an Apparatus for Transporting Patients Outboard —

The heavy cot lowering frame Admiralty pattern, as made by Ships Carpenters cannot be compared for general convenience and efficiency with the simple cot pole shown in the diagram

It is obvious that when it is necessary to rapidly place a cot or stretcher into a boat alongside probably in more or less motion, that the apparatus must be light though strong and capable of being rapidly and easily fixed and unfixed to the cot or stretcher



A simple cot pole (A) Loops for handles of stretcher or a pair of cots to pass through the rope handles and hitch over ends of pole

In this modified 'Achilles' cot pole the loops can be rapidly placed over the stretcher handles (and wheels) and the stretcher securely lowered

Similarly these same loops can be rapidly passed through the corner grummets of the cot and hitched over the end of the cot pole (It will be found that they have no tendency to slip off, but if advisable a stop would easily secure them)

The heavy wooden frame supplied is cumbersome and impracticable in any sea-way, as was the unanimous opinion of executive officers and ourselves

Originally a check line was made fast to the head and to the foot of each cot or stretcher when passed outboard, and manœuvred from the

ship. Now we make the check lines fast, one to each end of the cot pole itself, and the whole is manœuvred from the receiving boat when the patient has passed outboard, a distance gain in rapidity.

The following practice evolution was carried out in harbour. Boats available launch and cutter; twenty severely wounded. Placed in eleven cots and on two Mansfield stretchers. The whole collected in neck bay and adjoining lee side deck. Modified Achilles cot pole rigged to smaller derrick each side of quarter deck. The patients were carried aft and swung out rapidly and conveniently each side of ship simultaneously. The cots and stretchers were placed fore and aft on the thwarts, eight in the cutter and twelve in the launch. Time actually taken was twenty-two minutes out and eighteen minutes in, but could well be reduced to fifteen minutes for the whole evolution, provided weather is suitable.

Fleet Surgeon J. W. Craig writes on the Origin of Enteric and Paratyphoid Fevers at Gallipoli and Lemnos in 1915:—

All cases were attributable to one of four causes: (1) Infection [illegible] men brought on board from the Beach Party detachment; [illegible] infection from drinking water from contaminated wells or eating [illegible] or other fruit while on beach duty or detached service; (3) infected [illegible] food on board which had been contaminated by flies—those [illegible] infect plague swarming off to the ship in every port and probably [illegible] directly; (4) infection by swallowing water while bathing [illegible] foul and contaminated by the dejecta of all the warships [illegible] hospital ships and the encampments, hospitals and villages [illegible] stores. I cannot definitely ascribe the epidemic to any one of [illegible]. I can practically trace some to the first two, but these are [illegible] must be put down to one or other of the two last named. [illegible] prevalent ashore where it was generally saturated [illegible] Gallipoli. In favour of water being also [illegible] that diarrhœa, dysentery and enteric affected [illegible] French Party detachment of Marines. They received their [illegible] Rehance, where it was distilled but owing to primary [illegible] it was transported to their tank in a cutter with [illegible] passage was mixed with harbour water. Analysis [illegible] in addition to salt, much organic matter. When this [illegible] this body of men became one of the healthiest in [illegible].

Reviews

[illegible] Operative Treatise [illegible] by the Author [illegible] Edited by Milnell and Cox [illegible] 1 vol. 8vo. 394 pp.

[illegible] treatise on operative surgery. [illegible] comprises in all three [illegible] volumes will appear [illegible] of the French edition are to [illegible] performed at the Institut [illegible] relating to the surgery of the [illegible] blood and treatment of [illegible] by the author. The [illegible] of the existing French edition [illegible] the second French edition [illegible]

[illegible] followed by Part I [illegible] at the [illegible] necessity of [illegible] author and that [illegible] obstetrical [illegible] types the [illegible] *Institut Chir* [illegible] three adopted. [illegible] himself be [illegible] tions are least [illegible] surgery of the [illegible] high at temperatures. By [illegible] to obtain effects [illegible] depth [illegible] crotomes [illegible] to so rapid that it is [illegible] good [illegible] destruction of tissue [illegible] tions than that [illegible] by fulguration in a good [illegible] frequency [illegible] electro coagulation are of very high [illegible] and low tension while in fulguration they are of feeble impedance [illegible] high voltage.

Part II contains the first section devoted to regional surgery, including operations on the scalp and cranium, auditory, visual and olfactory apparatus and operations on the sinuses of the face. Craniectomy receives full attention and the author's burrs to replace the crowned trephine, and saws are described. The burrs and saws used for craniectomy are worked by an electric motor of 0.5 h.p. the manipulation

of these instruments on osseous anatomical specimens is identical with that applied to the human body and the operator is advised to practise previously on a skull or femur fixed in a vice and also to follow carefully the instructions as here indicated Aided by electric power each orifice of perforation requires only a period of five or six seconds the section of the intermediate osseous bridges being rapidly completed with saws also worked by electric power two small peripheral bridges are left to prevent dropping of the osseous shutter and are divided later by a mallet and special chisel

The illustrations throughout the volume are good and well produced the majority showing actual conditions during various stages of operations, neither the operator nor his assistants wear gloves but in the section on general surgical technique the necessity of wearing gloves is indicated

The task of translating a work of this kind into English presents many difficulties but the description on the whole is very clear certain expressions occur, however which might be improved upon with advantage such as, for example the genel region the pavillon of the ear ' and the sentence the phenol vapours chased the flies

The original methods of Doyen his innovations in surgical technique his inventive and mechanical genius as shown by the many instruments designed by him, and his studies in cancer and treatment of cancer by electro coagulation, assure that this book will have great interest for surgeons in this country we predict for it as wide publicity in England as it has had in French speaking countries

THE TREATMENT OF INFECTED WOUNDS By A Carrel and G Dehelly Translation by Herbert Child formerly Surgeon French Red Cross Captain, R A M C (T V) With introduction by Sir Anthony A Bowlby, K C M G K C V O F R C S Surgeon General Army Medical Service, Advising Consulting Surgeon to the British Armies in France London Baillière, Tindall and Cox 1917 Pp x + 238 With 97 illustrations and 6 plates Price 5s net

The English edition of this book appears at an opportune moment and will ensure to Carrel s method a proper trial in this country Sir Anthony Bowlby writes in high praise of the treatment which is now in extensive use in the Army, and expresses the appreciation of British surgeons at the Front of its value He suggests that if the method is to be fairly judged no change should be made in Dakin s solution, or in the tubes for instilling it and that it will be time enough to introduce modifications after a prolonged trial as advised in the present publication The researches and experiments upon which this treatment is founded, were made in the laboratories of the Rockefeller Foundation at Compiègne and at the Temporary Hospital No 21 under the *Service du Santé militaire* the chemical laboratory being directed by Dr H D Dakin

In an introduction the authors sketch the events which have led many surgeons to disregard the teaching of Lister to forget his fundamental observations and to introduce the treatment by saline or hypertonic solutions with the result that theory remained impotent and infection flourished Here it may be stated that the treatment of infected wounds by saline or hypertonic solutions has never found favour in the Royal Navy They remark also that the problem of wound

sterilization would appear to be readily [illegible] contributing to the tissues and of sufficient [illegible] microbes present in the wound. Dakin's [illegible] appropriate technique and with microscopical [illegible] such a sterilization that large, deep [illegible] completely within a remarkably short interval [illegible] wound. Also owing to this rapid healing, the [illegible] and adhesions in muscle, tendon and nerve [illegible] to onset that infection suppuration is prolonged. The great merit of [illegible] treatment is its simplicity. One of the disadvantages has been [illegible] by the retention of the lotion by the fluid in the case of large wounds [illegible] can be easily obviated by the provision of mackintosh sheets or [illegible] trays in dressings. Throughout this book all details of the technique [illegible] Carrel's method are dealt with in the clearest manner and it is [illegible] utmost importance to follow them strictly if the best results are [illegible] obtained. The illustrations help the reader to understand the technique [illegible] quickly and several interesting plates show that large infected wounds [illegible] be closed and sutured after sterilization has been coordinated for a [illegible] period. The translation is white and excellent in all respects.

It should be remembered that it is necessary to acquire a clinical knowledge of this method of treatment before attempting to apply it and in fact the authors recommend an apprenticeship of three weeks. This book will recall the essential details of the technique to those who know something of its application and will be found of the greatest practical value.

NOTES ON MILITARY ORTHOPAEDICS. By Colonel Robert Jones, C.B., Inspector of Military Orthopaedics, Army Medical Service. With an Introductory Note by Surgeon-General Sir Alfred Keogh, G.C.B., Director-General, Army Medical Service. London: Cassell and Co. (published for the British Red Cross Society). 1917. Pp. xiv + 133. With 128 illustrations. Price 2s. 6d. net.

In this preface the Orthopaedic Centres which have been opened by the War Office in many of our principal towns are commended in high terms. The wounded soldier discharged and wearied by the monotonous round of previous hospital life, is employed in these curative workshops at regular useful and productive work and soon begins to feel that he is fit to earn a living or to serve the State in an economic sense with corresponding benefit to his health and happiness. In an introductory note Sir Alfred Keogh remarks upon the present importance and wide extension of orthopaedic principles, the problems of the maimed and wounded soldier and the reunion of physical infirmity to industrial work. He concludes: If this work brings home to the surgeon the necessity for a correlation between early and late surgical procedures and at the same time succeeds in obtaining for the discharged and disabled soldier the same surgical interest as is displayed on his behalf in the earlier days of his incapacity, it will prove to be a very solid contribution to national efficiency.

The subject matter of this book appeared originally in the *British Medical Journal* during 1916 as a series of articles and has now been arranged in seven chapters as follows: Positions of election in ankylosis

following gunshot injuries of joints suture of nerves and alternative methods of treatment by transplantation of tendon the soldier's foot and the treatment of common deformities of the foot malunited and ununited fractures transplantation of bone and some uses of the bone graft; dislocations of the knee joint the mechanical treatment of fractures under war conditions In Chapter III many useful hints are given on such subjects as the treatment of flat foot, the technique of the preferred operation for hallux valgus and hammer toe, the treatment of metatarsalgia and the qualities of a good marching boot For setting bone grafts a double circular saw, electrically driven, is used The grafts should not be washed in saline solution nor left in saline while something else is being done but should be laid directly on the prepared bed in which all bleeding has been stopped In the preferred operation on the internal semilunar cartilage the incision is of 1 to 1½ in over the anterior end of the cartilage sloping very slightly downwards and inwards nearly but not quite parallel to the upper edge of the tibia The application of the Thomas's splint is described very fully in Chapter VII

The ground covered in this book is wide but it is not intended as an exhaustive treatise It is an index of the author's originality and experience in a subject now of high importance and should prove of great value to our readers

MINOR SURGERY AND BANDAGING (HEATH POLLARD) FOR THE USE OF HOUSE SURGEONS, DRESSERS AND JUNIOR PRACTITIONERS By H Morriston Davies M D M C Cantab F R C S, Captain, R A M C Attached 3rd London General Hospital Surgeon University College Hospital Surgeon, City of London Hospital for Diseases of the Chest Consulting Surgeon, Finsbury Sanatorium Sixteenth Edition. London J and A Churchill 1917 Pp x + 476 With 252 illustrations Price 8s 6d net

The first edition of this book appeared in the year 1861 and since then at intervals of three four or five years complete revisions have been undertaken It is only three years since the fifteenth edition was published and now once again the whole book has been completely revised for this the sixteenth edition The main features of the book are known to many of our readers Except for the addition of a new chapter on the general principles of the treatment of gunshot wounds of the limbs, the general plan has not been altered

The duties and work of the house surgeon and the dresser are indicated and then the whole subject of minor surgery is dealt with in a thorough manner Emergency operations are described some at length such as tracheotomy, and short accounts of many other operations are given such as for empyema thoracis varicose veins varicocele and Bassini's radical cure These short descriptions of operations are put before the reader so clearly that he cannot fail to find them of value in fixing the salient points in his memory especially before study of a larger work The chapter on the administration of anæsthetics by Dr Dudley Buxton and Dr Felix Rood is good and concise and has been brought thoroughly up to date

The illustrations are numerous and instructive The book as a whole can be strongly recommended to medical officers of the Navy

GLAUCOMA A HANDBOOK FOR THE GENERAL PRACTITIONER By Robert Henry Elliot M D B S Lond, Sc D Edin F R C S Eng Ac Lieutenant Colonel I M S (retired) Late Superintendent of the Government Ophthalmic Hospital, Madras late Professor of Ophthalmology Medical College Madras and late Fellow of the University of Madras Honorary Fellow of the American Academy of Ophthalmology and Otolaryngology 1917 London H K Lewis and Co, Ltd Pp xii + 60 With 5 plates and other illustrations Price 3s 6d net

This is a short concise monograph—57 dainty octavo pages—written primarily for perusal by the busy medical practitioner, and brings to our notice the most recent conclusions—as regards pathogeny, pathology and treatment—in the morbid state whose signs and symptoms are grouped under the one heading—Glaucoma

Any product of the nimble brain of Lieutenant Colonel Elliot is worthy of study his style is bright and clear, and the work now before us is sufficiently brief for the exigencies of War time A useful resume of the normal and morbid anatomy of the parts concerned in glaucoma and a consideration of the intra ocular pressure and the tension of the eye (tonometry) with description and illustration of Schiotz's tonometer are given with admirable photomicrographs by Professor A Thomson and others

The causes of glaucoma—predisposing and exciting—receive a complete chapter, and the author wisely guards against confusion of 'post hoc' and 'propter hoc' in connection with the significance of the morbid condition under consideration

The diagnosis of simple and congestive (acute and subacute) glaucoma and the signs and symptoms on which it is founded are stated

The treatment of glaucoma resolves itself into the relief of hypertony by operation Von Graefe's original procedure is mentioned but chiefly consideration is given to recent experimental methods (Lagrange Herbert Holth Poigos and Elliot) which provide a fistulous connection between the fluid in the anterior chamber and the potential subconjunctival connective tissue spaces in the adjacent region of the limbus corneæ The sclero corneal trephining operation of the author is described and illustrated by a neat diagram Secondary glaucoma occupies another chapter and finally the congenital and juvenile forms of glaucoma are discussed, due mainly to hypertony acting on a non sclerosed fibrous globe of the imperfectly developed eye Time alone will show whether the condition of hypotony and its sequelæ which may follow sclerectomy will encourage the extended use of such methods

CATECHISM SERIES Third Edition Edinburgh L and S Livingstone Price 1s 3d net

The primary object of this series of books is to provide a condensed summary of the standard text books arranged in question and answer form To the student of medicine these will doubtless prove a useful accessory in the problem, not of acquiring knowledge but of retaining it in his memory The sections themselves being small and handy may be carried in the pocket ready for use at any odd moment Thus we can picture the student during the daily morning train journey refreshing his work of the night before by reading one of these catechisms in order to

[illegible] facts upon his overburdened mind. Employed in such a manner or regarded as a means of reviewing the main lectures of a subject rapidly these elementary manuals of instruction will occupy their true position

The danger lies, as in all such compendiums that the slothful student will place too much reliance upon them believing that thereby he will obtain a passport to the calling of qualification with a subnormal amount of intellectual exertion In such cases disappointment grows very bitter Kelly's well known keys to the classics never produced a scholar but not infrequently they were of great assistance to him If, then we view this series of handbooks in the same light their import and sphere of influence will be evident

Surgery—Part I This volume deals with the general pathology of surgery wounds and burns deformities of the limbs and venereal diseases Much information is presented in simple tabular form

Surgery—Part II This contains the principal facts with regard to fractures dislocations and diseases of bone Several diagrams demonstrate the displacement produced by individual muscles in certain types of fracture while the illustrations depicting the various epiphyses should be helpful

Materia Medica—Part I The appearance properties and dosage of the alkaloids and organic compounds are set forth in good order This book has been revised according to the latest edition of the British Pharmacopœia

Materia Medica—Part II The inorganic salts, carbon compounds, and organic acids receive their quota of recognition in this section Preparations such as aqueous collodion and extracts are defined and the methods of preparing them explained

Physiology—Part I In this volume the properties of muscle and nerve are described The paragraphs dealing with heart vasomotor mechanism and blood are of special interest to the clinician in view of the great advances made during the past decade The diagrams are excellent

Pathology—Part I This section embraces animal parasites degenerations abnormalities of the blood supply and the lesions resulting therefrom A large mass of information has been compressed into a very small space

THE CONDITION OF SEX IN MAN By L Rumsey Dawson, F R C P Lond M R C S Eng, late member of the Council of the Obstetrical Society of London and Fellow of the Royal Society of Medicine formerly Resident Obstetric House Physician to the Westminster Hospital Second Edition London H K Lewis and Co Ltd 1917 Pp xii + 225 With 22 illustrations Price 7s 6d net

The advent of this second edition is most opportune The whole Empire is suffering and will continue to suffer from an abnormally heavy drain on manhood It is not too much to say that the birth of sons to the nation is now an Imperial necessity

The author propounds a new theory of sex based on clinical materials and he shows not only how the sex of the unborn child following the birth of the first born can be predicted with mathematical certainty but he also clearly demonstrates how a male sex can be produced at will—

again after the birth of the [illegible] born. The theory ma[illegible] that the male parent has no influence in the ramination of [illegible] rests entirely with the female. She has in her two ovaries the [illegible] definitely sexed ova ready for the mere fertilizing action of the [illegible] woman so that though in infertile sex the ripened ovum he does [illegible] the sex. Secondly the theory maintains that male ova come [illegible] from the right ovary and female ova only from the left ovary. Thirdly the author proves that the ovaries normally perform their function alternately the exception to this rule being the occurrence of boy and girl twins and different sexed multiple births when clearly there must have been simultaneous ovulation by both ovaries.

The data required to correctly foretell the sex of the normal child are: Date of the birth of the last child, sex of that child, duration of mother's menstrual periods, how often the periods occur—in every twenty eight days, every twenty one days or every thirty days? Are the periods always regular? When did the menstrual period reappear after confinement? The dates of all periods seen since the last child was born. Dates of birth and sex of the other children, how long was the last child suckled, if at all? When is the next period expected? Have there been any miscarriages since the last child was born? Given the last child birthday we go backwards forty weeks to find the ovulation month or month in which the ovum was fertilized which yielded the child. The sex of this child being known we then proceed alternately from this ovulation month until we come down to the tenth ovulation period prior to the expected month of birth of the coming child allowing an extra or thirteenth ovulation between each December and January of the year following if the actual period dates are not known. Because of the thirteen ovulations per annum it follows that if a patient has a child in one month of one year and another child in the same month of the next year the sex would be the opposite. The production of either sex at will must consist in avoiding any attempt at fertilization in the months during which an ovum of the sex which is not desired is produced. Hence to secure a different sex child to the child last born we must first find the ovulation month of the last child i.e., the month during which the ovum shed was fertilized according to the rules laid down above. The sex of the former child being already known we then reckon alternately month by month, and so find the months which correspond in sex to the one which provided the last ovum. During these months therefore no intercourse must take place or conversely intercourse should take place during the alternate months. Of course if the left ovary happens to be sterile no girl can be born, or if the right ovary be sterile no boy can be produced but if fertilization ensues during one of the other months we shall certainly obtain a child of the opposite sex to that last born.

The book gives evidence of indefatigable industry and the author arranges his facts in a masterly order which is overwhelmingly convincing.

We think he proves his theory up to the hilt and he claims 97 per cent of successes in his prophecies the 3 per cent failures being due solely to wrong data given to him by the mothers.

Pulmonary Tuberculosis in General Practice. By Halliday G. Sutherland M.D. Edin. Consulting Tuberculosis Officer for North Marylebone, and Medical Officer to the St. Marylebone Tuberculosis Dispensary. Emergency Surgeon in His Majesty's Fleet. some-

time Pathologist to the Liverpool Hospital for Consumption and Diseases of the Chest &c London Cassell and Co, Ltd 1916 Pp 269 with 6 plates 42 figures in the text and 9 charts Price 10s 6d net

The author has set out to describe especially for the benefit of general practitioners the modern views on Pulmonary Tuberculosis, the clinical and bacteriological means of diagnosis and the logical treatment of the disease All these are closely interwoven one with another and of of prime importance to the practitioner mean even more to his patients and to the Empire

To control and eradicate tuberculosis it is necessary that we should be familiar with all the known facts connected with the malady itself from a clinical point of view Bearing this in mind the writer has limited the space devoted to the pathology of the subject to the minimum necessary for the interpretation of clinical signs

It is of great interest to know that the book was written in the neighbourhood of the Equator, on board the armed merchant cruiser Empress of Britain and that Fleet Surgeon Tomlinson and Surgeon Lewis assisted the author by drawing some of the diagrams Chapter I deals with etiology and the bacteriological aspects of the disease in Chapter II the pathology of infection is considered, the course of the illness and symptoms are described in Chapters III and IV physical signs in the lungs and other organs and systems are discussed in a clear interesting and instructive manner in Chapters V and VI three succeeding chapters are devoted to diagnosis by X rays bacteriological methods and tuberculin tests respectively, treatment is exhaustively dealt with in the final chapters

We can very strongly recommend this book to our colleagues

HINTS FOR HOSPITAL ORDERLIES By N Corbet Fletcher M B M R C S London John Bale Sons and Danielsson, Ltd 1917 Pp 38 Price 6d net

This little book deals with the objects and duties of hospital orderlies, care of ward care of patients care of orderly and details of orderly duties Originally written for those who during days of peace voluntarily trained themselves in ambulance and Red Cross work members of the Royal Naval sick berth staff and auxiliary services will find that the information and advice given is useful and practical

LA CHIRURGIA DEGLI ORGANI DI MOVIMENTO Vol I fasc 1 Marzo, 1917 Direzione Instituto Ortopedico Bologna Amministrazione Via Farini 8 Bologna (Agents in England Messrs Williams and Norgate 14, Henrietta Street, W C) Price 28s per annum

The issue of the first volume of a journal specially devoted to the study of the surgery of the organs of locomotion is most opportune Coming as it does at a time when countless victims of the world war returned to civil life are suffering silently from impaired function of the lower extremities no efforts directed towards ameliorating if not actually removing this disability can be anything but a help and benefit to the human race

The journal, published in Bologna, is gracefully dedicated to the memory of the Italian orthopædic authority—Alessandro Codivilla, upon the fifth anniversary of whose death it was first published

The ideal [illegible] by Putti the editor, modestly [illegible] the [illegible] of the [illegible] author defines its programme [illegible] knowledge of that branch of medicine having for its object the study of the organs of locomotion, collecting and propagating the researches of those who have devoted themselves to the subject

The volume in question contains four original articles all of them too long for close review in these pages but each one of great and varying interest

The first, written by the Editor, Dr V Putti deals with the return of movement in ankylosed knee joints by surgical measures looking to the formation of new joints, i e arthrosis or arthroplasty The pathology histology and the indications for and methods of surgical procedure are all carefully and thoroughly discussed The whole matter is profusely illustrated by photographs, diagrams and skiagrams showing the results obtainable by surgical methods in suitable cases results which at first sight seem almost incredible but which are confirmed by actual photographs and cinema films

The second article by Dr Giuliano Vanghetti Surgeon in Chief to the Italian Red Cross, is a retrospect of progress in the restoration of function by muscle and nerve suture in other words plastic surgery It is comprehensive in detail and fully supplied with references to other workers in the same field Strangely enough there is an entire absence of reference to British authorities

To the anatomist the third article upon the normal anatomy and pathology of the bones of the foot especially in regard to traumatic lesions by Dr R Dobiola is of great interest It is well illustrated by numerous skiagrams and a portion of the article is devoted to the discussion of war wounds

Dr V Serio contributes an interesting article upon sesamoid bones their uses and their histology A varied selection of microphotographs adds to the utility and interest of the article

We have no hesitation in recommending this, the first number of a new periodical to those interested in its special subject The book is well got up in better than the average continental publication and the type and illustrations are very clear The price to foreign subscribers 35 lire per annum roughly about 28s which is not exorbitant

REVUE DE CHIMIOTHÉRAPIE ET DE MÉDECINE GÉNÉRALE 1re ANN, No 1 Jan—Fév 1917 Rédaction et Administration 2 rue de Rivoli et 3 rue de Savigné Paris

This review of chimiotherapy of which Dr J Leumonier is *rédacteur en chef*, has recently been issued

Notwithstanding the fact that two French physicians Dr Dujardin Beaumetz and Dr Bardet about twenty years ago were the true originators of the science of chimiotherapy the Germans have claimed it as their own, and hitherto the publications on this subject have been chiefly of German origin This want much to be regretted is now filled by the *Chimiotherapy Review*, the first number of which contains an article on the chimiotherapeutical properties of colloidal iodine by the editor a review of the chimiotherapy of tuberculosis by J M on the present position of anti tetanic serotherapy by Dr Henri Bouquet and several abstracts from American journals

Abstracts and Translations.

M[illegible] (W.) and Howland (J.) Phosphate Retent[illegible] [illegible] Production of Acidosis in Nephritis. *Arch. Int. Med.* [illegible] [illegible] pp. 708-711.

[illegible] well known to occur in nephritis especially in the [illegible] [illegible] is not like the acidosis of diabetes and starvation [illegible] [illegible] of acetone bodies for these do not appear in the [illegible] [illegible] in increased quantities in the blood. The [illegible] [illegible] is due to the accumulation of inorganic phosphates [illegible] [illegible] to the failure of the kidneys to excrete them. This [illegible] is [illegible] general salt retention. It seems to be due to [illegible] specific [illegible] and may occur without retention of chlorides [illegible] cases of severe [illegible] acidosis this retention of phosphates [illegible] necessarily [illegible]. The acidosis due to phosphate retention [illegible] can be [illegible] by the administration of alkalies but the disease [illegible] progresses in spite of elimination for the accumulated phosphates [illegible] blood [illegible] though neutralized are capable of seriously [illegible] the [illegible]. The excess of phosphates diminishes the content [illegible] in the urine by increasing its excretion by the bowel. As [illegible] [illegible] the increased excretion of phosphates by the bowel [illegible] [illegible] is beneficial. H. D. R.

Kiss[illegible] (L.) The Relation of Hypertrophic Osteoarthropathy [illegible] Pulmonary Tuberculosis. *Arch. Int. Med.* Chicago 1917, vol. xx, pp. [illegible].

This [illegible] of the x-ray examination of the bones in 100 patients with pulmonary tuberculosis in the second or third stage of the disease shows that there is no bone changes in the long bones [illegible] without [illegible] or symptoms and that bony changes in so-called [illegible] are more common than is commonly supposed. The bone changes in the same but differ in these two conditions: the long bones show a subperiosteal layer of bone and clubbed fingers may show only thickening like exostoses of the tips of the [illegible] phalanges with nodular projections of the bases of these phalanges which are sometimes like true osteophytes. Investigation of a well marked case of hypertrophic osteoarthropathy failed to show any alteration from the normal as regards the nitrogen and calcium metabolism. Out of the 100 patients he showed clubbed fingers without any bony changes, seventeen clubbing of the fingers with bony changes in the phalanges and ten clubbing of the fingers and changes in the long bones. H. D. R.

Cohn (A. I.) and Jamieson (R. A.) The Action of Digitalis in Pneumonia. *Journ. Exper. Med.* Baltimore, 1917, vol. xxv, pp. 65-82.

Digitalis has long been used in the treatment of pneumonia but its value has been disputed and Sir James Mackenzie has never seen much good follow the administration of digitalis in acute febrile states. The factors exciting the heart, such as high temperature, toxins or the

[illegible] by [illegible] influence on the heart [illegible] this canon [illegible] observed 100 cases of pn[illegible] the Hosp[illegible] Institute, New York, and to[illegible] radiograp[illegible] digitalis given by the mouth in the f[illegible] temperature (4[illegible] death) to forty nine patients while the ol[illegible] patients served as controls The results of the observ[illegible] that digitalis acts during the febrile period of pneumonia [illegible] exerts a beneficial possibly a life saving, effect in cases of auricular irregularity (fibrillation and flutter) and that whatever beneficial action it has on the function of the normally beating non febrile heart may be expected from its use in the febrile heart in pneumonia The control cases in which digitalis was not given did not show the interference with auriculo ventricular conduction seen in acute rheumatism diphtheria enteric typhoid and occasionally in influenza The explanation of this difference is that these infections produce myocardial changes which probably do not occur in pneumonia It therefore appears that the use of digitalis in pneumonia stands on a different footing than in these infections

H D R

Atypical Manifestations of Infection by *Spirochæta icterohæmorrhagica*

This form of spirochætal jaundice has a better prognosis on the Western Front than in Japan where the case mortality has been estimated at from 30 to 18 per cent As the outcome of this severity of the disease the spirochæte has been chiefly sought for in severe cases of jaundice Garnier (M) and Reilley (J) (*Bull et mem soc méd des hôp de Paris* 1917 3 ser, tome xli, pp 69 75) writing on the slight forms of this disease report cases in which jaundice is almost the sole manifestation and would therefore be regarded clinically as catarrhal

This form of spirochætosis is now well recognized to occur without jaundice and Bloch (M) and Hebert (P), (*ibid*, pp 75 82) report two cases of this spirochétose anictérique in which the symptoms were those of severe meningitis but lumbar puncture showed the cerebro spinal fluid to be normal

H D R

Costa (S) et Thoisier (J) Sur la Spirochetose ictéro hémorragique *Compt rend Soc de Biol*, Paris, 1918 tome lxxix pp 1038 1041 1917, tome lxxx, pp 196 197

In spirochætal jaundice (*S icterohæmorrhagica*) meningeal changes are frequent and important In fact in cases of such spirochætal infection without jaundice the clinical aspect may be that of meningitis simple or relapsing The authors found that the cerebro spinal fluid of three patients with this form of spirochætal jaundice was virulent to guinea pigs and caused the disease The cerebral substance of the guinea pigs was also virulent as shown by injection of cerebral emulsion into further guinea pigs The Wassermann reaction for syphilis is very frequently positive in spirochætosis hæmorrhagica and the spirochæte appears to pass into the amniotic fluid of the experimental pregnant guinea pig

H D R

[illegible] et Durand (P) Le Rat d'Egout Reservoir de Virus [illegible] Spirochétose ictéro hémorragique *Bull et Mém Soc Méd [illegible] Hôp de Paris* 1917, 3 ser, tome xli pp 115 118

Jaundice due to the *Spirochæta icterohemorrhagica* (*vide* Abstract [illegible] vol ii p 380) described by the Japanese observers has now been [illegible] recognized on the Western Front It does not spread from the [illegible] to others and fleas and mosquitoes do not convey the infection [illegible] Japanese observers found the spirochete in the rat and Courmont [illegible] Dumas examined fifty sewer rats in Lyon where this form of spiro[illegible] jaundice is not known Four rats were found to contain the [illegible] and it is suggested that even in districts where this form of [illegible] jaundice is not seen in man, the sewer rat forms the reservoir [illegible] virus H D R

[illegible] (D Jordan) On Vitamines Amino acids and other Chemical Factors involved in the Growth of the Meningococcus *Journ Pathology and Bacteriology* Cambridge 1916, vol xxi pp 113 130

Experiments to throw light on the underlying principles which determine the success or failure of a medium for the growth of the meningococcus showed that the primary cultivation of the micro organism in vitro [illegible] only in the presence of bodies of the type of accessory growth factors (vitamines) which are in the gut non in mammalian diet and [illegible] in blood serum milk, or animal fluids and probably in [illegible] tissues Ordinary nutrient agar does not support the growth [illegible] meningococcus unless the latter is an old laboratory culture or is [illegible] very thickly on to the medium After many subcultures the [illegible] coccus becomes more or less independent of an abundant vita[illegible] provided that the medium contains abundant free amino [illegible] Wide thickly sown on the medium some of the meningococci die [illegible] vitamine supply to the survivors The accessory growth [illegible] (vitamines) are not readily destroyed by heat are soluble in water [illegible] alcohol and are rapidly adsorbed from solution by filter paper lint [illegible] wool There is no inverse relation between the amount [illegible] present in the medium and the amount of vitamine necessary [illegible] to the growth of laboratory strains and the action of the [illegible] with factors may be to increase the reaction velocity of the [illegible] metabolism of the meningococcus The main food require[illegible] of the meningococcus are the products of protein hydrolysis [illegible] Cultures of the meningococcus must be kept permanently [illegible] in order to retain their virulence H D R

[illegible] (M) Noir Josserand (L) et Langlion (L) De la disparition de la glycose dans le liquide des méningites méningococcique et [illegible] sa signification au cours de traitement Quelques applications cliniques *Soc de Physiol et Path gén* Paris 1914 10 tome xvi pp 1080 1081 (Published November 1916)

The disappearance of the normal reducing agent in the cerebro spinal fluid seen in various forms of meningitis especially in that due to meningococcic infection is caused by the fermentative action of the bacteria In tuberculous meningitis however the reducing body does not disappear [illegible] does it do so in the meningism which may occur in connection [illegible] influenza and malaria By means of testing the cerebro

[illegible] ing body [illegible] cho-spinal fever (in which [illegible] the [illegible] ing body is al[illegible] e n be distinguished from the meningism often seen [illegible] o manifestation of serum disease (méningite sérique)—in which the reducing body is pre[illegible] t H D R

CAZAMIAN Ictère hepatogène consecutive à une intoxication par le salvarsan *Arch. de Méd et Pharm* [illegible] Paris 1917 tome cin pp 46 62

While nervous and renal manifestations after injections of salvarsan are well known the occurrence of jaundice is rare According to Milian it occurred in six out of 1 500 patients and is usually slight, lasting three to six weeks and accompanied by fever rapid pulse (110-130), lumbar pain usually transient albuminuria and urobilinuria but without bile pigment in the urine More marked jaundice is less often seen usually after a third intravenous injection Recovery almost always follows Milian considered that the jaundice was haemolytic but in Cazamian s case this was not so, and it was regarded as due to hepatic changes The patient had a slow pulse (42) which was quickened by atropine to 70 thus showing that there was no block in the auriculo ventricular bundle and that the bradycardia was due to vagal inhibition As polygraph tracings proved that extra systoles were absent, Bard s view that the slow pulse of jaundice is apparent only and due to extra systoles did not apply to this case H D R

VIGUIER, COULOMB ET JEAN Contribution à l étude de la Chirurgie de Guerre d après les Observations de Blessés du C E O traités à l Hôpital Maritime permanent de Sidi Abdallah (1915 1916) *Arch de Méd et Pharm* [illegible] Paris 1917 tome cin pp 5-25 81 89

IN this work our aim is not to record all that we have seen and examined in the wounded of the Expeditionary Corps of the Dardanelles and we shall limit ourselves to certain main features After having expressed certain general views on war surgery and on treatment we will study successively according to our observations —

(1) Fracture of the skull by firearms
(2) Penetrating wounds of the chest by projectiles of war
(3) Arterial and venous wounds by firearms
(4) Fractures of limbs by firearms
(5) (Finally) Observations on some cases of tetanus

In setting forth conclusions we do not pretend to solve questions we only wish to contribute to a study which is so absorbing at the present moment

General Reflections —On reading a work in which the treatment of war wounds and the results of operations are discussed, before expressing judgment of the author s conclusions consideration must be taken of the circumstances of time place, assistants and equipment under which the wounded have been treated One cannot compare results of sanitary formations at the front with those of hospitals at the base or the statistics of an ambulance at the front in a war of movement with those of another ambulance during trench warfare Everything is different the nature of the wounds the number of wounded the chance equipment, or the far better surgical equipment even at the front when

there is no disorganization the time and the [illegible] is available either to make a simple dressing or perform an [illegible] operation, whether to disinfect to open the wound and to suppress or limit the infection

If this distinction be admitted our series of observations must rank as those made in a hospital at the base, seeing that we describe the wounds of the Expeditionary Corps of the East, nursed in Tunis

Means of Evacuation

Whereas in France the wounded are sent to the base chiefly by railway, here necessarily all are brought by ship These must be divided into two very distinct categories the chartered ships and the hospital ships

(1) *Chartered Ships*—The chartered ships are only a cheaper means of transport necessitated by circumstances when it is a question of withdrawing the wounded and even the sick the hospital transports on the contrary respond to every possible desiderata, between these two means of withdrawal by sea there is the same difference as between the ordinary travellers train fitted up for wounded and a sanitary train constructed with all the comforts for this particular object Far from us is the thought of here finding fault with our admirable comrades embarked on these chartered ships, who with insufficient means laboured hard to do for the best moreover at the commencement of operations, hundreds of wounded were immediately put on board coming at times direct from relief stations on the battle field having a very small staff very low stores, no surgical equipment they could only perform renew the dressings, roughly provisional appliances for fractures and perform urgent operations

On their arrival at Bizerta also four to eight days after the date of their wounds, everything remained to be done at the hospital and at times help came too late many of the complications would have been avoided or would not have reached such a critical stage if suitable remedies had been given sooner These conditions affected the results of our operations it is partly to explain this that we have not remained at these details

(*B*) *Hospital Transports*—It was not the same when the wounded reached us by the hospital transports ships well equipped, provided with properly arranged operating theatres appliances for radiology and having a skilled surgical staff The wounded on board had received suitable care we had but to continue their treatment intervening only when necessitated by recent symptoms which we had not the regret of discovering too late We lay stress on the advantages of these hospital transports in order to show the necessity of providing these ships in sufficient numbers when it is a question of an expeditionary corps beyond the seas But these views on chartered ships and hospital transports apply above all to the period of May to August, 1915 as later, when the military hospitals of the base of Mudros were in working order we then only received men wounded about ten days previously or those who had been wounded one or two months and who were being moved to make room according to circumstances

Having thus specified the category of wounded with whom we have had to deal with regard to the date of the wounds and the means of evacuation we will now discuss the directives which have guided us in

their treatment We have certainly profited by the teaching of late recorded in the medical journals since the commencement of hostilities but even before the war we can affirm that our principles of war surgery were very eclectic that is to say, the military surgeon at the front must be guided in his treatment of wounded, in operations to be performed by the conditions of time and place of assistants and installation following at the same time medical reasonings and military requirements he can in turn be interventionist or conservative according to whichever method will be more beneficial to the wounded taking the above conditions into consideration

Eclectic Conservative Surgery—We consider on the contrary that the surgeon at the base should exercise, if not conservation in excess at least hopeful anticipation of it to the strongest degree because he has at his disposal, time staff and stores The Maritime Hospital of Sidi Abdallah comes under these conditions We have adopted the principle of conservation taking into account the symptoms and the general state of the wounded and the local condition of the wounds The general state is governed by the nature of the primitive infection of wounds—if the wounds in their earliest stages have not been carefully disinfected cleansed and opened if septicæmia and the true gaseous gangrene have developed whatever one does subsequently the prognosis is mostly grave and the surgeon at the base are almost reduced to impotence as far as the use of surgical means is concerned. If, on the contrary, the primary infection of the wounds confines itself to local complications the duty of the surgeon at the base is plain he should fight for conservation if the general condition of the patient is satisfactory but should be become weaker on account of local lesions causing attacks on the nephro hepatic viscera he should not hesitate too long intervention is imperative, in spite of his strong desire to avoid it whenever possible

In this struggle for conservation and also against local complications of wounds the surgeon must bear in mind certain accepted facts Firstly, wounds of the lower limbs are more difficult to cure than those of the upper with the same methods of conservation the reasons of this difference lie either in the fact of the immobility in bed or in the texture of the bones (for instance the tarsal bones) or are due to primary infection being more common and more severe in the lower limbs than in the upper

Antiseptic Methods.—In addition to which the surgeon at the base in the struggle for conservation cannot confine himself to aseptic methods for infected wounds, he must have recourse to antiseptic methods but in mild forms Therefore immediately the wounded arrived from the front we did not hesitate to advise all the surgeons not to confine themselves to sterilized dressings but to make discreet use of antiseptics Amongst these we have much extolled a weak solution of permanganate of potash it certainly has the drawback of discolouring the surgeon's hands the parts surrounding the wounds and of thus hiding the inflammatory reactions, and of staining the linen In spite of these drawbacks we find in it qualities of the best order as an antiseptic and deodorizer whilst hindering the vitality of the tissues In wards full of patients with suppurating wounds there did not exist the slightest odour as was remarked by many visitors Under its action greyish wounds with fœtid pus cleanse themselves and granulate It is possible to follow the stage

of infection of the wounds and the resistance of the tissues according to the discoloration of the dark wine colour of the antiseptic produced by the pus on the dressing is found a colorimetric scale of the healing of the wounds or of their stagnation

The use of antiseptics must necessarily be completed by adjuvant means Thus to give conservation a chance the surgeon at the base must not hesitate to open and drain as much as possible, as was done when patients arrived infected at times with the dressing from the relief station or a simple dressing done on board But we do not confine ourselves to this when it is a question of wounds of the upper limbs or of the extremities of the lower limbs without delay our wounded were treated in prolonged baths two or three times a day

Continuous Irrigation —Acting on the same principles of old surgery we had resumed continuous irrigation of wounds with the help of weak solutions of permanganate of potash before any one referred to this method with Dakin s fluid We consider we owe to it the preservation of limbs or parts of limbs which even with daily dressings and with drainage could not have been saved

On the arrival of infected wounded a question of great importance frequently presents itself to the surgeon at the base as it is often a matter of wounds complicated by fractures with splinters of bone how should he proceed? Our rule of procedure was as follows incisions, opening up and necessary drainage were practised but systematic extraction of free splinters of bone was not made leaving all those that appeared to have probabilities of vitality the more so when it was a question of fractures of the diaphysis We were less conservative in the case of articular fractures when the fragments impeded drainage which is so important in treating infections of articular surfaces By the way we should state on the subject of suppurating arthritis we have never hastily practised resections we contented ourselves with very ample drainage with immobility and partial atypic resections

We have just mentioned, apropos of suppurating arthritis the word immobility which plays so great a part in the treatment of compound fractures of limbs, above all when conservative surgery is practised

Plaster Appliances —We value plaster appliances as a precious help in this struggle for conservation they facilitate the daily dressings without causing useless suffering to the patients, with certain precautions allow continuous irrigation, enable the patient to sit and to make certain movements in his bed until with special plaster appliances he can be taken out and permitted to walk Therefore at the Hospital of Sidi Abdallah we made every known model of plaster appliances, from the grooved splints of Hergott or of Maisonneuve to the appliances provided with rings of Lance and of Manson and those of continuous extension of Delbet, &c With plaster appliances judiciously chosen, the means of conservation are greatly facilitated because whilst immobilizing the diseased part the patient is not kept confined to bed but is benefited by air and light

Heliotherapy —In Tunis thanks to the balconies with which the Hospital of Sidi Abdallah is furnished we have made much use of heliotherapy in treating the wounded, and nothing but good effects have resulted As soon as the acute stage of wounds has passed this treatment hastened their cicatrization in stimulating the vitality of the tissues in

modifying the [illegible] and [illegible] the general condition. In every [illegible] military surgeon must pay great attention to the last, the more [illegible] the wishes for primary conservative surgery. Apropos of the general condition of the wounded amongst those evacuated from the Dardanelles, we found on their arrival in Bizerte two distinct stages: at the beginning, during the first two months we found men generally strong and vigorous; subsequently this expedition became very trying for the troops as after their spell in the trenches the men did not find at the base the relative calm of the French front with variety of nourishment. From this fact the resistance of the wounded was *a priori* much weakened against infection.

Amputation.—But with every desire for conservation we did not hesitate to amputate when resort to do so was imperative. Such was the case when it was the question of wounded attacked by gaseous gangrene or septicæmia, so long as the general condition left some hope. Amputation must be reckoned from with the moribund. When possible to intervene, the point of amputation was chosen far from the seat of the wound far from the nucleus of infection but whether on account of local diffusion, or the general condition or on account of the fatigues of transport by sea the results in this category did not give satisfaction whatever were the methods of amputation especially those connected with the lower limbs. On the contrary amputation necessitated by lesions of local nature (gangrene by defective nutrition following violent crushing affecting the vessels nerves and tendons) furnished us with excellent results. In these case from the point of view of operative procedure we were guided by the state of the traumatism. If it were a question of an upper limb we invariably endeavoured to preserve as much of the limb as possible by amputating at the seat of the fracture by cutting atypic flaps by only cutting off just enough bone of the upper fragment to allow the flaps to cover it and to give a terminal or termino lateral cicatrization.

For the lower limbs our line of conduct was different to start with. Above all for leg amputations we admit we have made too much of the site of insertion of the stump and for achieving prosthesis with artificial appliances possible for many of our patients after amputation supra malleolar when the wounded will have returned to civil life in the country. For the thigh however we have preserved as much as possible. Later we became very conservative and particularly for the femur in serious fracture we practised Lisfranc Chopart sub astragalus and Pirogoff the more of the atypic according to the flaps at our disposal.

In treating this question of amputations we wish here to record an important observation. We received at the hospital brought off ships convoy patients with limbs amputated chiefly for gangrene who had had the stumps totally sutured with drainage it is true, but with stitches through skin and muscle. In these cases the result of this totally sewing up the stumps could not have been worse. On undoing the dressings we found the stumps greatly infected removing the stitches we were in presence of flaps infiltrated with purulent sinuses along the vessels the nerve trunks, and in the interstices of the muscle tissue. By means of great care and of frequent drainage very painful to the patient we succeeded in saving some of these cases but we had to regret

deaths which, in our opinion should not have supervened. We therefore, condemn complete sewing after amputation for infected war wounds, even if the flaps appear healthy even if the place of amputation appears remote from the seat of the infected wound strictly speaking we would only tolerate, of course with most careful drainage a few silver threads in bring together the parts of the limb in the interval of the dressings to mould them and to prevent retraction.

Nature of the Wound inflicting Agent.—On the subject of the nature of the wound inflicting agent amongst the wounded from the Dardanelles we have desire to give certain circumstantial information. We have had to treat few bayonet wounds by far the greatest major by were caused by projectiles bullets shrapnel fragments of shell and bombs. At the commencement we had to treat mostly men wounded by gunshot but very rapidly every variety of wound by bayonet appeared and since the period of trench warfare, wounds by shells and bombs have sensibly increased like most observers we shall point out the gravity and the frequent infection of this last category of wounds.

Number of Wounded Treated.—From May 1915 to February 1916, the permanent maritime Hospital of Sidi Abdallah, had to treat 3 061 wounded but it was principally at the commencement during the months of May, June and July, 1915 that about half of these wounded were admitted to hospital in particular we recall to mind that in the period from May 5 to 15, 1915, the hospital had to face an evacuation of 1 000 wounded these figures demonstrate better than all commentary the cases on which the views we have just disclosed are based.

Number of Operations.—More than 400 different operations have been performed by us and in this number we do not include incisions subcutaneous extractions of bullets opening of wounds necessitated by infection we limit this category to important operations performed in the theatre.

(1) Wounds of the Skull by Fire-arms.

Etiology.—Wounds of the skull were particularly numerous in our wards for serious cases and represent about 8 5 per cent of wounds by fire arms. We had to treat 59 fractures of the skull.

The fractures observed were caused in 38 cases by bullets 15 cases by shells 3 cases by shrapnel 3 cases by bombs and in 1 case by explosion of a mine.

These statistics are only approximate, as many wounded, particularly the Senegalese were often unaware of the agent of their traumatism.

The bones of the skull most frequently affected were frontal in 26 cases parietal in 18 cases occipital in 10 cases the great wing of the sphenoid in 4 cases the squamous portion of the temporal in 3 cases and the petrous portion of the temporal in 4 cases. In most cases the dura mater was perforated in only proved to be intact in about 27 per cent of the cases.

In four of those latter cases we noticed complete absence of pulsation which led us to incise the dura mater. The incisions gave outlet to clots of blood and cerebral matter in pulp which confirms the possibility of contusion of the brain by contusion without appreciable dural lesions.

Symptoms and Diagnosis.—Symptomatology of wounds of the skull is so well known that it would be useless to repeat it here we will restrict

ourselves in the course of this article to describing any symptoms which have appeared interesting We will dwell above all on the diagnosis of fractures of the skull

In wounds of the skull it is really necessary to at once divide those which only affect the teguments from those which affect the osseous skull and its contents In eighty nine patients with skull wounds there were twenty-four of scalp wounds and fifty nine of fractured skull We will speak little of properly so called scalp wounds if they appear require a few stitches or if there is a little inflammation drawing together with a few stitches by metal clips and disinfection suffice to stimulate rapid cicatrization

In a single case we had an immense phlegmon filling all the upper part of the scalp and necessitating much drainage The cicatrices obtained are supple and have never induced neuralgia The treatment of scalp wounds is thus very simple, but one point cannot be too strongly urged and it is that clinical diagnosis is almost impossible It is a diagnosis that must be made by elimination, knife in hand A certain patient wounded by bomb arrives with a cicatrized wound of some millimetres walking aid to all appearances he should shortly be given his discharge these after careful examination a serious fracture is found Another one shows a lacerated, infiltrated wound with tegumentary qualities giving the idea of a serious traumatism of the skull which on examination prove to be superficial hematomata No doubt evident symptoms exist when there are serious lesions of the skull paralysis, Jacksonian crises, psychic troubles slackening, pulse pupillary dilatation, &c, but these same serious lesions can exist without these symptoms

Complications of Fractures of the Skull—Of all the complications observed the most frequent and also the most grave was acute meningo encephalitis This disease supervenes towards the end of the first week the incubation is latent All our patients with lesions were operated on at least nine days after their wounds this explains the rapid appearance of this disease amongst these The disease predominated above all in cases of perforated dura mater but we have seen it develop in cases of dura mater macroscopically intact and pulsating well We observed amongst our patients operated on thirteen cases of acute meningo encephalitis Nearly always death supervened from the third to the tenth day

We have first observed abscesses of the brain some were acute and these are the most numerous some others developed slowly Of nine abscesses of the brain three have started slowly Acute abscesses are generally easy to diagnose but in certain cases no clinical symptom at times not even that of a fracture, gives any warning of this terrible encephalitis

Four of our patients have had encephalic repteres of which three were caused by deep abscesses

Beyond infectious complications serious troubles must also be noted resulting from anatomical lesions by the projectile or the splinters of bone

We have observed three cases of ruptures of venous sinuses of the skull, with one death from meningo encephalitis one case of hemiplegia, one case of monoplegia, three cases of amblyopia from lesions of the

cuneus [illegible] last cases have been manifestly improved by intervention. We shall quote a very interesting case of aphasia of Wernicke.

[illegible] a bullet which fractured the squamosal portion of the temporal [illegible] Jackson epilepsy delirium total mental confusion [illegible] Aphasia is found in the Sylvian zone to the left [illegible] the crises of epilepsy disappear. The patient [illegible] There still remains partial mental [illegible] attention but transient catatonic [illegible] characterized by intermittent verbal [illegible] [illegible] No paraphasia. No amnesia. The aphasic remains [illegible]

[illegible] later period we saw the patient we always made [illegible] of the skull failure to follow this principle [illegible] twenty nine patients arriving with diagnosis [illegible] of the skull clinically appearing as such, we found on [illegible] lines of the skull.

The [illegible] carried out with cocaine the incision is made with [illegible] periosteum and a raspatory used to detach. Various medical pulleteers recommend that the bones should be handed as little as possible. However we have noticed that often the superficial wound does not correspond with the osseous lesion, particularly in the temporal [illegible] and we are of opinion above all when there are clinical signs of bacterial [illegible] it is necessary to scrape copiously in the endeavour to find the seat of fracture.

We have chiefly made the concave outer incision with regard to the base of the skull and are is easier than in cruciform incisions and in lengthening these incisions the necessary space is obtained except in the temporal region. [illegible] we have made many incisions T or L shaped.

Technique of Trephining.—All our trephining operations have been performed with a Doyen fraise of 16 mm. This fraise is attached to a special section which fits on the perforating pin or pyramid of the centre [illegible] The intermediate section invented by one of us (Dr. Jean) to transform the ordinary trephine into a Doyen trephine is of nickelled steel it is 2 cm. long and chamfered from end to end one end being square to fit on the pyramid and the other round to receive the rounded shank of the fraise. [illegible] two thumb screws complete the adjustment.

The perforator is prepared with the point of the perforating pin or pyramid which slightly cuts the external table from 2 mm. to 3 mm. The intermediate section with the fraise previously attached is immediately fixed on the square shank and the trephining is continued. Less time is lost than with a Doyen trephine where requires the drill to be unmounted [illegible] fraise to be fixed. Finally if wished the old crown can be [illegible] with the same centre bit.

If we take for example a fracture caused by bullet the fraise hole [illegible] from the opening due to the entry of the projectile the [illegible] fixed two strokes of a shoulder chisel remove the osseous [illegible] between the two openings and there is at once sufficient space to insert the gouge forceps of more or less powerful grip which allows trephining as extensive as is desired. In ordinary cases all this work is done in a few minutes (generally in less than ten minutes). The

seat of the fracture is carefully freed from bone splinters and foreign matter

After craniotomy two alternatives occur the dura mater is intact or much perforated, and in the latter case if cerebral matter exudes pulsations must be sought for if these are absent we examine carefully with a blunt instrument the contused seat of the brain and the examination is a rule, admits of an extraction of intracerebral bone splinters or of projectiles For these last a grooved probe slightly curved at the end facilitates the extraction We have been able thus to extract 10 per cent of intracerebral projectiles, but we must insist on the fact that these examinations should remain superficial, excepting in cases where the projectile has been localized by radiography and that systematic search for the projectile should not be the aim of the intervention at least on arrival of the patient

In the case of intact dura mater two alternatives again occur the brain pulsates or not In this latter case we have always done well with an incision made with a grooved needle or with the point of a bistoury laid flat greatly inclined on the dural plane we have been able to evacuate subdural hæmatomata (33 per cent of cases of intact dura mater not pulsating) When the dura mater pulsated we prudently abstained from touching it at any rate when no special symptom obliged us

In great destructions of the skull our intervention was confined to resecting the edges of the seat with gouge forceps particularly to overcome the overlapping of the bones and to drain

In two cases we had to treat bipolar fractures The anatomical destruction was considerable We intervened in these two cases considering the two orifices as separate fractures even if there were intermediate fissures In spite of the exceptional gravity of these fractures we were able to save one of these patients

As example of double fracture of the skull we will quote a case of a patient hit by a bullet in the left temporal lobe the exit being through the eye on the same side we trephined in the temporal lobe and enucleated the eye by the operation of Krönlein all the bones of the temporal lobe being fractured The patient left cured

All our trephined patients were drained with iodoformed gauze or with horse hair (bilobed drainage) We only used india rubber drains for intracerebral drainage of abscesses Plugging easily mastered hæmorrhage of the sinus in three observed cases Apart from the shock craniotomy done by skilled operators is in itself therefore a benign and rapid intervention It is a simple incision of the bone that can be made as easily as an exploratory incision of soft tissues

If it is necessary to remove mobile or impacted splinters of bone the important portions of mobile bones must not be touched for example an occipital or a semi frontal with a supercilliary arch These large gaps of no advantage to the patient aggravate the later prognosis of trephining (greater tendency of the brain to traumatisms and above all the fatal cerebral adhesions of these gaps difficult to fill up)

Treatment of Complications. (a) *Acute Meningo encephalitis* —In one case as a last hope we tried intervention, although without success performing extensive trephining disinfection and drainage In the other cases the medication was purely symptomatic

([illegible] —We [illegible] absc[illegible]ting and stimulant poiet on the brain [illegible] made with a long [illegible] and exhausted with a syring[illegible] In ye the pus hcin, too thick does not come, and we hu[illegible]eved prebe which serod to hasten the pus once [illegible] fixed to the skin by a horse hair, and maintained at the [illegible] incan cess.

Th[illegible] is always grave in spite of intervention In nine cases of prop[illegible] called abscess of the encephalon we have only had three recoveries

Fr[illegible] Fractures Fracture —We refrained from intervening in five cases Three of these patients arrived with meningo-encephalitis in evolution and had hardly reached the wards before they died The two other case had fractures of the petrous portion of the temporal bone in [illegible] signs of cerebral compression or of meningo encephalitis both recovered spontaneously with a complication in one of facial paralysis We intervened in five cases three times to extract splinters of bone not extracted in the course of the first intervention twice to evacuate abscesses of the brain We did forty seven trephining operations in our ward which resulted in twenty three deaths that is to say 49 per cent We do not here reckon the mortality due to later aggravation as in most cases we are unaware what becomes of our patients From all evidence it appears that the rather heavy mortality should be attributed to the lapse of time often very long separating the wound from the intervention This interval on an average was nine days the minimum five days and the maximum sixteen days excepting in the case of the Serbian soldiers who with disastrous results even only operated on two or three months after their wounds In spite of this delay which was always greatly against operating confirms our mortality for fractures of the skull did not sensibly exceed those of the wounded in the Front in France operated on immediately after their wounds

The patients at the Dardanelles operated on immediately after their wounds and left by the hospital transports in our wards give 70 per cent of recoveries (omitting the immediate post operation mortality which we do not know) The mortality from fractures of the skull depends on the gravity of anatomical lesions and above all on infection If in effect we compare these fractures with those observed during the same period and due to bullets into Dunkerque or Doiles at Sidi-Abdallah we had 80 per cent of recoveries in the surgery of patients operated on

We have been unable to follow up all our patients with fractures of the skull evacuated in course of treatment or sent convalescent to France to be able to judge of subsequent complications particularly the consequences of great loss of osseous substance necessitating osteoplasty In one case resulting from fracture of the frontal with perforation of the frontal sinus leaving a partial retracted cicatrix adherent to the dura mater we resected the cicatrix and grafted under the teguments a fragment of adipose tissue taken from the hypochondrium These adipose graftings should be voluminous so as not to be quickly absorbed and we prefer cartilaginous grafting which gave us excellent results in an analogous case of fracture of the skull caused by a fall, these graftings do not absorb and are rapidly incorporated with the osseous plate

(2) Penetrating [illegible]

Etiology.—[illegible] but in these [illegible] her of eighteen [illegible] or perforating [illegible] is removed apart from the [illegible] bone [illegible] death or by tetanus [illegible] bone.

Nearly all the [illegible] ment of the cases.

Fragments of skull [illegible] which 6 per cent were [illegible]

Pathological Effects.—[illegible] located into openings [illegible] in 30 cases. Of these [illegible] right through as the [illegible] side opposite the opening [illegible] affected the pleura [illegible] anterior mediastinum [illegible] we have actually [illegible] times in the terminal [illegible] pulmonary tissue with [illegible] interlobular [illegible] to us are the bullets [illegible] that which is found [illegible] by the incomprehensible [illegible]

We did not trace any [illegible] discovered by [illegible] heart; this bullet [illegible] symptom of [illegible]

We had lesions [illegible] case the cause [illegible] the stomach [illegible] other [illegible]

To this enumeration [illegible] wall and particularly [illegible] publications do not lay sufficient [illegible] prognosis or amounts of the [illegible] fragments of bone or of [illegible] splinters acting as a projectile [illegible] tissue.

Symptomatology.—We will [illegible] established by ourselves but in [illegible] tion in nearly all our wounded [illegible] ent of cases and at times constantly [illegible] of the patient the hemoptysis [illegible] lasted two or three days. Hemoptysis [illegible] condary hemoptysis) was rare mild and [illegible] consisted of expectoration of sputum reddish and [illegible] by [illegible]

Subcutaneous emphysema is [illegible] (18 per cent of cases) limited to the bare circumference of the [illegible] openings. Emphysema of the base of the neck of peribronchial origin has never been established, even after great ruptures of the lung.

Dyspno[illegible] mptom on which one cannot rely with [illegible] whenever we observed it, it was [illegible] ly [illegible] o is

On the o[illegible] n, from lesions of the pulmonary parenchyma [illegible] n or inwardly or rewardly We have only [illegible] hemorrhage

More of[illegible] ns in the pleura, and one has to [illegible] trating wounds we have found [illegible] rule it is not frequent We will not [illegible] which nearly always suffice to establish [illegible] an exploring incision when [illegible] Towards the fifteenth day the roentgenoscopic [illegible] finished or on the road to [illegible]

T[illegible] n hæmothorax or not [illegible] pneumothorax with lev[illegible]

[illegible] s affected in yet another [illegible] In twelve cases, we [illegible] slow breathing more [illegible] cases is absent or insign[illegible] ses definitely rusty All [illegible] dual by Professor Pierry [illegible] the name of syndrome [illegible] on to the research of [illegible] cases initial fever [illegible] case however we came [illegible] subsidence by lysis [illegible] monia with or without [illegible] the pathogenic microbe [illegible] separating hæmothorax

We rar[illegible] chest either to ascertain the post[illegible] the hæmothorax Radioscopy [illegible] hæmothorax [illegible] dark stain answering to the dull [illegible] is no p[illegible] the line of level [illegible] the obscure is mostly indistinct, if the [illegible] is discovered thanks to two symptoms [illegible] line of level is clear [illegible] ently shaken the patient little undulations [illegible] the surface [illegible] are seen About every eight days [illegible] should [illegible] which enable an estimate to be formed [illegible] the degree of reabsorption of the effusion and the patient should not be given his discharge until the dark ones are effaced Finally media[illegible] displacements can be [illegible] radioscopy

In pleuro pulmonary wounds must be added wounds of other thoracic organs We have not had to treat wounds of the heart, excepting the juxta cardiac bullet mentioned above In one case we had a wound of the anterior mediastinum a fragment of shell after having fractured the sternum lodged in the mediastinum without injuring either the lungs or large vessels At each respiratory movement pus came out from behind the sternum The patient was cured by repeated antiseptic lavages In four cases there was a wound of the diaphragm the projectile at the

saults, three having injured the chest and the abdomen. In two of these compound wounds abdominal symptoms predominated, the patients having arrived with fully developed peritonitis. The two other patients treated likewise by refraining from operation recovered without serious complications.

Complications.—Complications were of two classes:—

(*a*) *Hæmorrhagic.*—In two cases the patient died later of acute anæmia. Secondary hæmoptysis was rare (two cases).

(*b*) *Infective.*—Beyond traumatic pneumonia, usually benign, infection was manifest chiefly with respect to the pleura, particularly in cases of pneumo-hæmothorax. Excepting perhaps later the physical symptoms of pleural infection are variable and the diagnosis is made chiefly with the Pravaz syringe.

An interesting fact to note is that the majority of the cases of pyothorax (seven out of nine observed) belong to those of fractures of the chest. In the generality of cases there is fracture of the rib or of the scapula and the point where the infection starts appears nearly always to have been a seat of acute osteomyelitis. The pathogenesis of pyothorax which we propound appears to us to dominate the accepted idea of suppuration by retention of projectile as of our nine cases of pyothorax two only had their intrapulmonary projectile.

Finally, as has been noted by Toussaint and Baumgartner at the Society of Surgery in January 1915, these chest fractures have osseous splinters which travel far to traumatize the lung. From a wounded Turk we extracted from the top of the lung costal splinters 7 centimetres long; this extraction was accompanied by hæmoptysis and the patient recovered from the removal of the splinters and pyothorax.

This diagnosis of penetrating wounds with fracture is made by radiography, but furthermore and above all, with the finger in large scapular wounds, where it is often difficult to make a distinction between a simple subscapular swelling and a pyothorax opening under the scapula.

Prognosis.—Our conclusions like all those published up till now are marred by a fundamental error: it is not taking into consideration a great unknown number, the mortality on the field of battle and during the first days following the wound. After all we must remember that our patients with chest wounds arrived under the most unfavourable conditions, quite contrary to the doctrine of absolute immobility for this class of patient. As a matter of fact they reached us on an average after many transhipments the eighth day after their wound and sometimes on the fourteenth. Of 81 chest patients we lost 19. The causes of death were as follows: 4 by pyo-pneumothorax, 2 by septicæmia following complicated infected wounds, 1 by acute œdema of the lung, 2 by acute anæmia, and 2 by peritonitis (thoraco-abdominal compound wounds). In cases of pyothorax we lost five patients out of nine and even amongst these five there was one thoraco-abdominal wound complicated by peritonitis. One finds in the text books that the prognosis of simple penetrating wounds of the chest is benign and undoubtedly, as is stated, it is better to receive a bullet in the chest than in the femur. However these wounds appear to us more serious than is generally admitted. It must be remembered that many of those wounded die on the battle field or in the ambulances and that we only see the cases which are relatively not so grave and again, amongst these last latter complications come to darken the prognosis.

Fr[illegible] cases of simple penetrating wounds we hastened to give our [illegible] absolute rest after the long voyage they had undergone [illegible] and injections of camphorated oil

These patients must not be moved about no radioscopy before several days, an untimely extraction of subcutaneous projectiles, as we have often seen practised on many of our wounded who were operated on, on shore or on board a naval hospital ship Auscultation must be made very rapidly and then one must wait, keeping a careful watch on the temperature In cases of large haemothorax we have always abstained even from simple paracentesis and not one of our patients has died from mediastinal compression

If we believe in absolute abstention in simple cases it is not the same in cases of pyothorax where one must intervene rapidly and usefully

We will not describe the well known technique of these interventions, but we will urge certain inferences we have drawn from our intervention In presence of a pyothorax a pleurotomy must be made but must be made low down with a Pravaz syringe the lowest intercostal space must be sought where the pus is found in order that the pleurotomy be practised almost in the plenal cul de sac

This kind of low pleurotomy is necessary whatever be the level of the wound, even in pyothorax communicating with the outer air through large wounds and appearing *à priori* sufficiently drained We have thus transformed all the penetrating wounds of the scapular region with pyopneumothorax into ordinary purulent pleurisy A few days after these interventions the scapular wound is seen to close progressively This technique employed by us in June, 1915 has been since utilized by other surgeons (Dr Gasquet *Presse Médicale*, April 13 1916)

These pleurotomies were always practised with costal resection With cocaine such interventions are rapid not requiring from skilled surgeons more than three and a half minutes We used either stout and short India rubber tubes or the lamina with rubber valve of Ambert In the case of enclosed projectiles we always radioscoped our patients and extracted the superficial extrapulmonary projectiles in one case we were able to extract an intrapulmonary projectile situated in an abscess of the lung accompanying a pyothorax In the simple cases we always released from intrapulmonary extraction of projectiles, to which at this time the medical publications began to refer amongst the patients whom we have been able to follow up, the projectile was easily supported and did not cause any accident later on

(*To be continued*)

News of the Service.

MARRIAGE.

READE—NEWMARCH.—On April 28, 1917, at Christ Church, Westbourne Hill, by the Rev. H. D. L. Vinen, M.A., R.N., Senior Chaplain, Royal Naval Barracks, Chatham, Surgeon Arthur G. L. Reade, R.N.V.R., to Violet Newmarch, M.R.C.S. Eng., L.R.C.P. Lond.

CASUALTIES.

May 10, 1917.—The following Officer was presumed killed in action on passage home in the "Highland Prince":—

Temporary Surgeon A. M. Russell, R.N.

HONOURS AWARDED—MENTIONED IN DESPATCHES.

March 26, 1917.

The King has been graciously pleased to approve of the appointment of the undermentioned Officer to be an Companion of the Distinguished Service Order in recognition of his gallantry and devotion in the Field:—

Temporary Surgeon Harold Boulthee Padwick, R.N.

"For conspicuous gallantry and devotion to duty. He remained in the open and continued to tend the wounded under very heavy fire. Later he proceeded to Head Quarters and at great personal risk brought in many wounded men. He displayed great courage and determination throughout the operations."

May 10, 1917.

The King has been graciously pleased to give orders for the award of the Distinguished Service Cross to the undermentioned Officers in recognition of their services during the action between H.M. Ships "Swift" and "Broke" and German destroyers on the night of April 20-21, 1917:—

Surgeon Probationer Christopher Thomas Holcham, R.N.V.R. ("Broke"). Surgeon Probationer John Sinclair Westwater, R.N.V.R. ("Swift"). Work in with great energy and ability in attending to the wounded.

June 4, 1917.

The King has been graciously pleased, on the occasion of His Majesty's Birthday, to give orders for the following appointments to the Most Honourable Order of the Bath, in recognition of the services of the undermentioned Officers during the War:—

To be additional members of the Military Division of the Third Class, or Companions of the said Most Honourable Order:—

Surgeon General George Welsh, R.N. Fleet Surgeon John Menzies, M.D., R.N.

The following additional members of the Civil Division of the Third Class, or Companions of the said Most Honourable Order:—

Temporary Surgeon General Sir William Macewen, M.D., R.N.; Temporary Surgeon General George Robertson Turner, F.R.C.S., R.N.

The King has been graciously pleased, on occasion of His Majesty's Birthday, to give directions for the following appointment to the Most Distinguished Order of Saint Michael and Saint George, in recognition of valuable services rendered in connexion with the War:—

To be additional member of the Third Class, or Companion, of the said Most Distinguished Order:—

Fleet Surgeon George Thompson Bishop, R.N.

The following Officers have been mentioned in despatches:—

Surgeon John Desmond Milligan, M.B., R.N. March 26, 1917. Temporary Surgeon J. N. Mellon Ross, M.B., R.N. April 9, 1917.

The President of the French Republic has conferred the *Croix de Guerre avec Palme* on the undermentioned Officer for distinguished services rendered during the War:—

Surgeon John Desmond Milligan, M.B., R.N.

The following decorations were conferred by the Russian Government on the undermentioned Medical Officers of the Grand Fleet for distinguished service in the Battle of Jutland:—

[illegible] (with Swords).

Deputy [illegible] Deputy [illegible]
Robert H [illegible] Moon D S O [illegible]
C Fergus[illegible] M [illegible] M. Beadnell Fleet S[illegible]
Aust[illegible] Fleet S[illegible] S O M B Fleet Surg[illegible]
Philipson D S[illegible] C Gilland M B [illegible]
Ernest A [illegible] Lancelot [illegible] Boy [illegible]
Kenneth H [illegible] [illegible] Sedgwick M [illegible]

Ou[illegible] [illegible] (5th Swords)

Staff Surg[illegible] Staff Surgeon Thomas [illegible] Staff
Surgeon Jam[illegible]

Ou[illegible] 3rd Class (7th Swords)

Surgeon [illegible] B N V R Surgeon [illegible] Gilbert
Horton R N V R [illegible] Walter A Terry R N V R Surgeon
Probationer Wilfred [illegible] R N V R

PROMOTIONS

The undermentioned Officer has been promoted to the rank of Surgeon-General, dated April 17 1917 —

Deputy Surgeon-General P B Handcock M B

The undermentioned Officer has been promoted to the rank of Deputy Surgeon-General, dated April 17 1917 —

Fleet Surgeon W Bett M V O

The undermentioned Officers have been promoted to the rank of Staff Surgeon dated May 14 1917 —

Surgeons H E Bugg M B M P Fitzgerald M B J A G Malcolm M B H C Davis

The undermentioned Officer has been promoted to the acting rank of Staff Surgeon dated May 14 1917 —

Surgeons J. Hadwen M B H Burns M B

APPOINTMENTS

MARCH

Fleet Surgeons W B Trythall to the Victory addl; W G Westcott to the Vivid addl; H Cameron M B to the Pembroke addl; E B Pitchforth to Chatham Dockyard; C R. Rickard to the Minotaur; M H Knapp to the Jellicoe; C C Macmillan M B D S O to the Blake; J D Hughes to Devonport Dockyard; W B Trythall to the Tecumseh; J Bevan to the Osiris; H F I A Dalton to the Ramilies; A R Schofield M B to Medical Department of the Navy.

Staff Surgeons H A Browning to Rathlin; W T Stanton W Bradford to the Undaunted; A W Iredell to Kingfisher; Ar Stanton C R M Archer M B to the Victory addl; E A F W Burns B A to the Revenge; J D Kerr to the Cradock; A. B Cox M B, to the Cumberland; G J Vesey to the Southampton.

Surgeons R M Riggall to the Hermes; J S Diffey M B to R N Air Station Vindus; P E. Gibson M B M A to the Pembroke addl; E. MacEwen to the Crescent addl; F. J Burke M B to the Orontes; H W Hoff to the Pembroke addl; H B Parker to Hong Kong Hospital; A H Jones M B to Melin Dockyard; R A Rankine M B to the Adamant; W T Carson to the Hartypus; J C Holland to the Helenus; A G Valpy French to the Minstral Navy; E Moxon Browne to the Vivid addl.

Staff Surgeon R N V R. H J Morra to the Victory addl.

Surgeons R N V R P P Nicholas to the Iron Duke; D D I Macintyre M B to the Pembroke addl.

Temporary Surgeons W J C Watt M B to the Medway; D A Dunn to the Empress; H A Rewal M B to Dungavel Hospital; T W Hobhouse to the Lowestoft; R. W Pritchard to Plymouth Hospital; C W Archer M B F R C S to the Hospital Ship Garth Castle; G Hamilton M B to Haslar Hospital; A F Gew M B to Haslar Hospital; F C S Bewerunge the Drake; F W Saunders M B to the Victory; J S Geddie M B to the Agincourt; A R S Ward to the Vivien addl; V Magee to the Barrule; H W Cooke to the Curve; J I Pace to the

Victory add [illegible] to the Marlborough [illegible] M B to the Victory [illegible] W P Stuart [illegible] M B [illegible] D P B [illegible] to the [illegible] add [illegible] A. E. Gow M [illegible] Hospital [illegible] A Gutheving M [illegible] M B W of [illegible] Dued M H R A [illegible] Hospital [illegible] add [illegible] R D Nagle [illegible] M [illegible] W Hunt M B [illegible] Vic [illegible] A [illegible] Hals D R N Stat [illegible] R B Adams to the M [illegible] add M Nu [illegible] M B [illegible] add [illegible] L Blue M [illegible] the Royal [illegible] M B [illegible] Royal Marine [illegible] H R [illegible] Hospital [illegible] add B W [illegible] Black [illegible] W Bo [illegible] M [illegible] A [illegible] Hosp [illegible] H W Hope M [illegible] to the Gibraltar [illegible] S [illegible] M B to the Ram-Hals H S [illegible] Bu [illegible] the [illegible] J F Maugrd [illegible] Hud [illegible] S Scott to the [illegible] Surgeon-Lieut RNVR [illegible] H J Phillips to [illegible] M [illegible] J Learn [illegible] to the R [illegible] Bulbell W B M [illegible] J [illegible] the Monmouth [illegible] R Spr [illegible] J M R [illegible] to the Skilful [illegible] Fenpool R H [illegible] W [illegible] add W H [illegible] the V [illegible] J h C [illegible] to the Lupex [illegible] the Trimm A M [illegible] to the Mid [illegible] Law to the [illegible] J R [illegible] J Frant to the M [illegible] Bell to the M [illegible] C F M [illegible] to the Fisher d O H [illegible] to the [illegible] J C Sleigh to the Camelio

Surgeons-General W H [illegible] add [illegible] to the Admiralty to date Mar [illegible] add [illegible] to the Dale Jee I W W Hunt Plymouth Hospital

Fleet Surgeon J O Hanson [illegible] the Duke of Edinburgh [illegible] Jones M B to the Rod [illegible] M B A to the Colleps J C Weeks M B to the Zealandia [illegible] Rel [illegible] the Pembroke add M Tanner M B [illegible] the Medical Inspector [illegible] Westbrook M D to the Highlan [illegible] G F Bl [illegible] R [illegible] W [illegible] Stewart M B to the [illegible] add P M May [illegible] add [illegible] to the [illegible] Retail W H Lepel [illegible] add [illegible] Surgeon to the Trumbrook add

Staff Surgeons G Nunn to the [illegible] add [illegible] S Sill M B to the [illegible] L Rowan Robinson to the [illegible] H M Tucker to Shirley [illegible] F G Collett to [illegible] C S to the [illegible] R R Fasson M [illegible] the Cornwallis H D H B M B to the Prince Rupert

Surgeons Q H Richardson to the [illegible] M B to the Jenbrook add W B Bantah M B to the [illegible] Wellesley to the [illegible] Mexon Browne to the Gladiator

Staff Surgeons R N V R C [illegible] the [illegible] to the Cowdrey to the Yard add

Surgeons R N V R [illegible] to the [illegible] C J [illegible] Taylor to the Invincible add [illegible]

Fleet Surgeons C Warren M [illegible] to the Albion [illegible] W H Woodwright to the Ramillies W J C [illegible] the Barham H J M [illegible] to the Victor add [illegible] S Hewitt to the Triumph [illegible] R W T Valey to the [illegible] Pembroke add J L Trinder M B to the Pembroke add [illegible] to the Hants Hospital T E Phillips M B to the Vehlus G S Smith to the Pembroke add W H Blackburn to the Changuola R A [illegible] to the Victory add T R F Kirby to the Victory add N Jennings to the Hydra A V S Davies to the Calgarian A M Ross to Plymouth Hospital [illegible] L Cassidy M B,

B A. to the Vivid addl G N Slathers M B to the Leander E H Boyd to Barrow R N Air Station A O Courtis to the Victory addl S Wilson to the Royal Oak W A Bolley to the Victory addl F R Cripps to the Monarch J A Hadfield M B to Chatham Hospital R McM Bowman to Haslar Hospital C E W Lacey M B to R N Air Station Manston F Huffmann M B to the Pembroke addl H Gough to the Magpie T E Ashley R N Divisions J H Bracken to Plymouth Hospital M Pearson to Haslar Hospital L P L Fermin Edwards to Haslar Hospital F M Atkinson to Haslar Hospital J P Ross to Haslar Hospital D J Chatcher to Haslar Hospital J G Stevens to Chatham Hospital C J L Blen to Plymouth Hospital W V Gates to Plymouth Hospital I W Carte to the Vivid addl N Braithwaite to the Pembroke addl J Taylor to H Hen to Hospital J W B Bruce to the Victory addl T R S Thompson M B to Plymouth Hospital C S Oven to Haslar Hospital C G Terrell M B to the Victory addl H Webb to the Victory addl A V Cockayne to the Queen Elizabeth J L Lawson to the Victory addl G H Terry to the Lupin H F Tangling to Haslar Hospital D Heard M B to Chatham Hospital R T I Hughes M B to Plymouth Hospital H B Bennard to the Pembroke addl D W Waters M B to Plymouth Hospital I H B Hogg M B to the Leith Hospital I I Glass to the Pembroke addl J R M Barrow M B to the Pembroke addl M Nolan M B to the Lossiemouth R A Hobbs to the Albion G F Cobb to Chatham Hospital D L Baxter M B to R N Division B C Walsh to Normouth Hospital H C Billings to the Eden W A Moss to Haslar Hospital N Brillsante to Chatham Hospital C C Powell to Haslar Hospital F L Ashley to the Meteor J H A F Grimbly M B to the Hercules A F Spark M B to Plymouth Hospital A M Scott M B to Plymouth Hospital L J Fotheringham M B to Haslar Hospital R Wilson to Haslar Hospital J T Wylie M B to Chatham Hospital A G Holman to the Vivid addl R H Tasker to Plymouth Hospital I H Wood to Haslar Hospital R Cost to Haslar Hospital J B Bassh to Haslar Hospital I D Rutherford to Plymouth Hospital

Surgeon Lieutenants F Wilson to the Q 35 T C Wakefield to the Q 35 N R Hall to the Shrewsbury C C Brown to the Opportune L J Cowie to the Lincoln I Tolan to the Q 34 D R Lamley to the Sutlej A H Hickins to the Lemnos I Thomson the Lossiemouth W G Robertson to the Spindrift A W Fawcett I Ingles A J Blackley to the Lukeport H C Brown to the Mons J M Hunter to the Sheerglow M W Lo Sel to the Tenedos C S Dickson W B Cook H C Hall E A Logan A A Melvy W C Powell W P Wanner and J I Dennis to Haslar Hospital

MAY

Fleet Surgeons T H Vickers to the Vivid addl A Woolcombe to the Blandishment R McBlr M B to the Victory addl R M Rashada to the Powerful C J F Cook to the Suffolk R E Clark to the Vivid addl F H Boylen M D to the Victory addl J Wallace to the Vivid addl

Staff Surgeons A J Fleming D S O to the Fearless F F Anley to the Vivid addl H H C Glynn M B to the Decoy I L Craig M B to the Malaya W H Harrison to the Alacrity M J Laffan M B I A to the Vivid addl S S H Shrimpton I the Lambrick addl G Campbell to the Cornwallis G Nunn to the Helen H H S Miller M B to the Lossiemouth

Surgeons A C Rice M B to the Pembroke addl I A Montreff M B to the Pembroke addl A S Petersen M B to the Columbella R M Rigall to the Shark H I K Stephens M B to Plymouth Hospital R F Johnston to the Crest P B Walker I Hood Hospital A C Russell M B to the Incomparable I Leighton to the Calypso G H Hind addson to Royal Marines Deal D C Arthur to the Bellerophon W I Beattie M B to Haslar Hospital

Surgeons R N V R W J A Quince M B to the Alacrity addl I S Archer H M Smith Wellington addl W N Jackes M B to the Victory addl

Temporary Surgeons D M Lyman to Plymouth Hospital H G Moser to the Vivid addl W Hassard M D to the Sapphire I M Fraser M B to the Cotoxen H S Smith M B to Plymouth Hospital J Hollowell M B to the Victory addl H A R Mc M B to the Victory addl C W Lange M B to the Vivid P I Hurley H M B to the Vivid H W Hales to the Vivid L S Gunn to Plymouth Hospital I S Brown to Plymouth Hospital S J Hanks to Hospital Ship Maine to the R I Class to the Amethyst addl F L Cassidy to the Speedwell J S McGrail M B to Plymouth Hospital H S Stevenson M B to Plymouth

[illegible] M B to Chatham Hospital [illegible] Orion
[illegible] R W Toweler R C S to the Hurunui J L Pringle
[illegible] H Small to the Suffolk A L Hoare to Australian Auxiliary Squadron R W Leighton to the Inflexible
[illegible] M C Chalmers to Hospital J C McOctland M B J A
[illegible] R L Tritts to the [illegible] H C Wallis Chatham
[illegible] to the Victory add A D Coutts to the Sutlej R D
[illegible] N S Hughes to the Dolphin N S Stone to the Chatham
[illegible] R C S and A L [illegible] add A P Barrett to the Victory add
[illegible] and M B to Haslar Hospital J McKerrow M B to Chatham
[illegible] Henderson M B to Chatham Hospital R M Burrow M B to
[illegible] H Harvey to the Pembroke add J J F Lanaghan M B to
[illegible] Hopkins W F W Bates M B B A to the Dreadnought
[illegible] Barrell M B to the Victory add C P C Wakeley to Hospital
[illegible] C M Henson M B to Chatham Hospital F J Brett
[illegible] H Ellis to Holderness F H Fitzgerald to the Pembroke add A M
[illegible] K C F Maine to the Kilkenny Castle E Barlow M B
[illegible] Hospital H N Robinson M B to Chatham Hospital H
[illegible] the Pembroke, add A I Adamson M B to the Dreadnought
[illegible] M B to Hospital Ship Magic H F A Jewett to Chatham
[illegible] H M Little M B to the Lloyd M B to the Mars A E Struthers
[illegible] to Hoffman star to the M [illegible] and M B [illegible]
[illegible] W [illegible] to the Victory add [illegible] Fraser to Bellerophon H Hesketh
[illegible] M B to Chatham Hospital H Wright M D to Hospital
[illegible] Burgess J [illegible] M B to Hospital Ship Agadir C H Savill
[illegible] Vivid H E Biester to the Chevalier N Bantham to the
[illegible] T J Hunter to the Calypso P E Prendergast to Blymouth Hospital
[illegible] and M B to the Cassandra D Heard M B to the Triton B H [illegible]
[illegible] Ross to the Cumberland T R S Thompson M B to the
[illegible] C D Brown to the Victory add A A Cookayne to the Queen
[illegible] H Shaw M B to the Pembroke add H H Banks to the Victory
add

Surgeon Probationers, R N V R J B W Pellard to the Tamar A J Reid to the
[illegible] R N Macpherson to the Narwhal H Gordon to the Minerva H A A
[illegible] to Haslar Hospital C A Cowdrey to the Matchless C H Woolley to the
[illegible] R P Wankles to Haslar Hospital A J McAdam to the Sirius
[illegible] Duxbury to the Anchusa J B Taylor to the Cressida D J Menzies to the
[illegible] T J Stevenson to the Lowestoft A C Brotherton to the Llewellyn A Macleod to
[illegible] H Nesbitt D J Morrison to the Flushing D J McGregor to the Virginia
[illegible] Beckman to the Tetrarch C H Macnab to the Anchusa B Moore to the
[illegible] M B Dickson to the Cretan A L McAdam to the St. Mirren C R Cable to
the Lagan A W Taylor to the Beagle T Madill to the Sapphire B A D J
Barnhill to the North Star C G Newnham to the Midge W de M Stevens to
the Goodwin

ADMIRALTY ORDERS ISSUED FROM MARCH 1 TO MAY 31, 1917

(Only those orders which pertain especially to the duties of Medical Officers affect medical confidential are excluded)

992.—Health Lectures

(N M D 2198/17.—9 3 1917.)

Health lectures as laid down by the Instructions are to be given by the Senior Medical Officer of each ship and establishment and they should not be delegated to Junior Medical Officers unless under unavoidable circumstances

(C M O 284 1917.)

1123.—Glycerine—Economy in Use as Medical Store

(M D 3253/17.—16 3 1917.)

Owing to the urgent requirements of Glycerine in the Ministry of Munitions the strictest economy is to be exercised in its medical usage and in demanding supplies. Substitutes are to be used whenever practicable

(M O 148 17.)

1622. Medicinal Glycerine—Discontinuance of Supply

(M D 1558/17—27 4 1917)

In [illegible] M O 1119 17 glycerin will no longer be supplied [illegible] purposes [illegible] during the period of rationing. As a quantity [illegible] few instances where medical practitioners [illegible] [illegible] Ac

1236.—Sick Leave for Officers

(C W —30 1 1917)

W[illegible] allowed to [illegible] on sick leave in accordance with M 11 [illegible] information is to be included in the admission reporting [illegible]

(a) [illegible] sick leave granted in a [illegible] of Admiralty approval [illegible] have commencing

(b) [illegible] sick leave

[illegible] (d) is specially required in case it becomes necessary for the [illegible] with the Office concerned

(K R and A I —Art 1 96 (2) and M O 837/16.)

1232a. Medical Transport.

(M D 96 17—5 4 191)

[illegible] medical transport [illegible] placed under the [illegible] Principal Medical Officer Admiralty [illegible] M T C [illegible] supplied [illegible] to [illegible] the vessels and [illegible] will commence [illegible] before doing so [illegible] establishment concerned

(M O 944 17 amended)

1331.—Cerebro spinal Meningitis Carriers —Disposal

(N 6 4 191)

[illegible] of Cerebro spinal Meningitis who after three months [illegible] shall [illegible] forward [illegible] survey and included [illegible] discharge [illegible] these mentioned carriers from Hospital on [illegible] as isolation [illegible] should be given to the Medical Officer of Health of the local [illegible] which [illegible] of the fact [illegible] and the reason [illegible]

(M O 111 17)

1471.—Medical Transport Officer H M S Salsette North Shields

(M D 4 3 —14 4 1917)

' Medical North Shields, has been registered as the telegraphic address of the Medical Transport Officer H M S Salsette North Shields

1629.—Health—Weekly Report

(M D 1774/17—4 4 191)

The attention of all Medical Officers is drawn to M O 189/16 Weekly Report Health This report is records new with the M O issued is invariably to be [illegible]

(M D 189/17)

1629.—Health Lectures—Return

(M D 4775/17—3 4 1917)

Medical Officers are to state in their Sanitary Reports M 17 the number of Health Lectures delivered during the period the subjects of the lectures and the number of [illegible] attending them

(C M O 251 16 M O 962 17 and W C 1162/17)

1606.—Oxygen for Medical Purposes

Air Stations

(N S 11763—11 4 1917)

Oxygen for medical purposes should be ordered direct from Messrs The British Oxygen Co [illegible] and all cylinders [illegible] should [illegible] direct between the Air Stations and The Company All such transactions are to be reported to Admiralty (M D C)

Requirements of the gas for all other purposes should be obtained through the nearest Dockyard or Naval Store Depot

(M O 2646/16 W O s 2816/16 and 1383/17)

1293.—Vaccine—Return of Bottles and Caps.

(M D 5132/17—18 5 1917)

All ships and depots which have received vaccine from the Royal Naval College [illegible] should [illegible] as the [illegible] used return the bottles and caps to [illegible] taking special care to preserve the cap

VOLUME III [illegible] PART [illegible]

Journal

of the

Royal Naval Medical Service.

Original Articles.

A REPORT ON THE CASES OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM OBSERVED IN THE NEUROLOGICAL DEPARTMENT OF THE ROYAL NAVAL HOSPITAL HASLAR DURING TWELVE MONTHS

BY TEMPORARY SURGEON THIRDBRED CARTER M.A. M.D. Cantab.
M.R.C.P. Lond.

[illegible] the West End Hospital for Nervous Diseases [illegible] the Second Medical Division of the Royal Naval Hospital Haslar

WITH

AN INTRODUCTION TO THE PATHOLOGY OF SYPHILIS OF THE NERVOUS SYSTEM

BY SURGEON FAUNTLEROY DUDS M.A. M.B. B.C. Cantab. R.N.V.R.
[illegible] Medical Division of the Royal Naval Hospital Haslar

AND WITH

NOTES ON THE WASSERMANN REACTION AND ON THE EXAMINATION OF THE CEREBRO-SPINAL FLUID

BY TEMPORARY SURGEON S. L. BAKER M.R.C.S. L.R.C.P. L.N.

[illegible] PROGNOSIS

[illegible] clinical types of [illegible] that affects [illegible] under observation [illegible] hopeful [illegible] further [illegible] A considerable [illegible] in whom [illegible] in health [illegible] have been [illegible] prompt [illegible] and continuous [illegible] treatment [illegible] well [illegible] possibly [illegible] in spite [illegible]

[illegible] the result of treatment is to have [illegible] from time to time over several years [illegible] treatment really effective is to give it early [illegible] diagnosis must be made early. In the [illegible] in be examined constantly routine [illegible] is painted with the principles of [illegible] undertaken more frequently. All [illegible] men [illegible] of the nervous system must have [illegible] in which [illegible] such as pupillary changes are [illegible] Men may have no symptoms whatever but an [illegible] examination should detect these signs and the patient [illegible] sent to hospital for pathological proof of his syphilitic [illegible] shown by the examination of the cerebro spinal fluid [illegible] and for treatment. But too often the Service loses [illegible] by bitter experience by a neglect of some procedure of [illegible]

[illegible] enough that the recurrence of a positive [illegible] reaction in the serum does nothing more than signify [illegible] the patient has a syphilitic infection in him. It has not, [illegible] any significance in the question of diagnosis of syphilis [illegible] nervous system. Hundreds of men in the Service have a [illegible] reaction in their serum but are suffering from non [illegible] disease. *It is the examination of the cerebro spinal fluid*

[illegible]

[illegible] observation [illegible] of secondary syphilis, proved at the outset by laboratory tests, would be examined year by year until the Wassermann reaction remained negative tested at least twice a year for three or four years. Early and adequate treatment by the new remedies would never be omitted.

The following is an instance of what commonly occurs in practice. A man has been seen on the day of writing who developed a sore on the penis three months ago ten days after exposure to infection. He was sent at once to a hospital where it is known that facilities exist for the correct diagnosis of such cases. No laboratory tests were made, however, and the man was given three injections of galyl and discharged as duly as cured. The sore healed during the treatment. A week or so after his return to work the patient had three attacks of unconsciousness in one day, and he was sent to Haslar as probably a case of cerebral syphilis, with the note that he was recently under treatment for secondary syphilis. He has been proved to be suffering from cerebro-spinal syphilis at Haslar but it is unlikely that this has developed so soon after infection. On cross-examination the man admitted that he had a sore twenty years ago and it is thought certain that it was this sore which was his primary infection and the cause of the syphilitic involvement of his nervous system. If this is so the recent sore cannot have been syphilitic. It was probably a septic sore.

With reference to treatment, we are convinced that in the Service certainly and probably throughout the country 606 in its allied forms is given in inadequate quantity. We have not met with any cases at Haslar who tolerate badly large doses of these drugs, when given at suitable intervals. On the contrary, we are daily seeing men who have been given totally inadequate doses in the early stages of their disease and who are now suffering from relapses.

We have given up to fourteen full doses of 0·9 at half-weekly intervals to men suffering from early involvement of the nervous system with the result that in several cases we have had the satisfaction of watching the Wassermann reaction become negative in the cerebro-spinal fluid which the patient has been under observation.

A year's experience at Haslar has proved conclusively that a large proportion of all the cases of venereal disease in the Navy

[illegible] caused directly by syphilis. [illegible] nervous diseases of all sorts [illegible] which we have [illegible] immediate cause has been proved to be syphilis in [illegible] [illegible]

In order that these cases shall be detected in the early and curable stage *a neurologist should be attached to every naval hospital* not only in war time but also during peace. This has not been the custom of the Service in the past. Syphilis of the nervous system can now be *proved* by medical officers who possess a knowledge of the principles of neurological diagnosis and of modern pathological methods. In the past a certain diagnosis was possible only when the disease had reached an incurable stage. Before this stage was reached the diagnosis rested upon surmise.

Not all patients who are proved to be suffering from syphilitic nervous disease are invalided. Some return to duty. In every case we urge the patient to report to his doctor that he has been under treatment. This enables the doctor to obtain the results of the examination of the serum and cerebro spinal fluid if he so cares, and it serves to make the patient take an intelligent interest in his own disease and in its progress towards cure. All patients who are invalided are urged to report to some competent authority in six months after their discharge so that further tests may be made and treatment continued. It must be understood that in nearly all cases treatment by injection is necessary at least twice a year for a considerable time.

Before any reliable conclusions can be drawn from the examination of the patient, and more especially from the examination of his cerebro spinal fluid, it is imperative to know what treatment has been given previously, more particularly by injections.

Our experience at Haslar leads us to consider it probable that some syphilitic patients, at least an identified insane who should rightly remain at their hospital receiving vigorous treatment, and who, probably and in some cases almost certainly, will recover their mental health in a short time.

Section I.—An Introduction to the Pathology of Syphilis of the Central Nervous System. By Dr. Paul Fildes.

The intense study which has been directed upon syphilis in the past few years has thrown new light upon certain nervous diseases, some of which were acknowledged to be dependent upon syphilis, while others were not connected therewith according to the knowledge of the time.

by utilizing the new methods of diagnosis which have been elaborated the neurologist is now able to apply an entirely new series of diagnostic tests to a number of conditions which were formerly classified on a purely anatomical basis and by doing so has shown that syphilis is directly the cause of a surprisingly large number of all cases which are found in his charge.

This discovery is of great practical importance to the Navy. Instead of a number of patients vaguely classified as "nervous" or "mental" and as such, invalided or passed into Yarmouth there is shown to be a number of patients, many of whom are syphilitics and suffering from syphilitic disease of the nervous system. Now that the etiology of syphilis is known the disease can be diagnosed at an early stage and when diagnosed can be arrested or cured. On the other hand the etiology of other nervous diseases is not known, or if known the disease cannot be cured.

The question thus arises as to whether it would not be in many cases, an advantage to the Service to separate the syphilitics from the non syphilitics by appropriate methods of diagnosis, to treat them and perhaps to cure them.

To attain this end it is necessary to concentrate attention upon these neurological patients from the point of view of syphilis and to arrange that the neurological section of a hospital is in close touch with the bacteriological section as is the "venereal" section.

The General Pathology of Syphilis

It will assist in the understanding of the pathology of syphilitic disease of the nervous system if the general pathology of syphilis be considered.

Syphilis is looked upon generally as an infective disease which is characterized by the phenomena of three separate stages, namely the primary, secondary, and tertiary. This classification, however, purely arbitrary, serves no useful purpose, and is generally wrong. *There is no primary stage in syphilis.* There is indeed sometimes invariably, but not always, a lesion occurring at the point of inoculation. But this lesion has no special clinical or pathological significance. Its occurrence is more or less accidental. The idea for instance, prevalent that up to the time of the appearance of the primary sore the disease is local and that generalization occurs after this event. This assumption is of course wrong. The spirochaetes become generalized within a few hours of inoculation and the general infection becomes more and more intense right up to the time usually associated with the secondary rash.

We [illegible] or not [illegible] to bear [illegible] Again [illegible] thought that the rash is an [illegible] [illegible] the virus. Certainly it is the [illegible] [illegible] whether a rash [illegible] [illegible] The rash is the sore is often absent. [illegible] [illegible] described as being a definite period in which [illegible] observed but it is often difficult to say whether a lesion is secondary or early tertiary. There is no essential pathological [illegible] between a secondary lesion and a tertiary lesion which [illegible] permit of a sharp differentiation of the disease into three [illegible]

Syphilis should be looked upon more broadly. An individual is inoculated with the virus in the skin and this rapidly reaches the point of inoculation. A few spirochetes are often seen [illegible] blood stream. At the site of inoculation an inoculation [illegible] is because a certain time is required for the spirochetes to elaborate their toxins and a certain time is also required before the tissues develop the power of reaction. This time is the incubation period of the local lesion. In the same way as an incubation period exists after an antityphoid inoculation before agglutinins are developed so an incubation period exists in syphilis before the cell reaction develops.

This cell reaction is the chancre and it is an index of the effort of the tissues to circumvent the action of the spirochete. Some patients do not react to a typhoid inoculation and some do not react to the spirochete. Thus the chancre need not necessarily develop.

If the state of the general circulation is considered it will be found to be similar. Infection of the general circulation is almost immediate but the inoculation is so small and diffused that a longer incubation period is observed before the spirochetes have developed sufficiently to stimulate a reaction of the tissues. When this reaction occurs it is called a secondary rash and the period of time between inoculation and the secondary rash is the incubation period of the general reaction.

All these cell reactions both local and general, are protective in nature. They are developed in response to an intoxication to combat it in exactly the same way as a boil develops as an effort to overcome the intoxication of staphylococci. The constitutional symptoms which occur at the time of the rash are due largely to the destruction of spirochetes by the cell reaction and the consequent sudden liberation of large quantities of toxin. An identical rash and similar symptoms of intoxication—Herxheimer reaction—can be produced by the administration of a dose of '606' which also has the effect of killing spirochetes and liberating toxin.

By means of these cell reactions if they are successful the great mass of spirochetes in the system is destroyed and its destruction is often assisted by appropriate treatment But if the reaction has developed the spirochetes have had ample time to penetrate into all parts of the body and some may have penetrated into relatively non vascular tissues in which they are not destroyed by the natural anti mechanism or by drugs

The tissue in which the virus is most commonly lodged is the wall of a blood vessel particularly of large blood vessels and in these situations it may lie dormant or only slightly active for months or years

The tertiary stage may now develop As a result of the original infection the body tissues have become sensitized to the virus This is a phenomena akin to serum anaphylaxis If for instance if a patient is given a dose of anti diphtheritic serum his tissues become sensitized to the serum or hypersensitive in that if a second dose is given years later they react against it in an excessive degree They are as it were, ready for it and when it comes they strike suddenly without having to build up during an incubation period

If then, in the later stages of syphilis the spirochætes in the wall of a blood vessel succeed in overcoming the factors which hold them in check a small quantity of toxin becomes liberated and the surrounding tissues react with such violence that thrombosis of blood vessels occurs leading to necrosis and the formation of a large gumma

This sensitization of the tissues is the only real distinction between a secondary and a tertiary lesion In the secondary stage tissues react to a certain normal degree to a certain dose of toxin In the tertiary stage they react excessively to the same dose of toxin, so that a much larger lesion is produced by a much smaller intoxication In some persons sensitization may occur sooner than in others thus lesions tertiary in type may be found in what is usually looked upon as the secondary stage In fact the sensitization may develop without any intervening latent stage and the secondary may proceed directly into tertiary manifestations

The actual site of the tertiary lesion in the body appears to be more or less a matter of accident From work which has been carried on for several years at the London Hospital it is clear that the commonest site is in the aorta and large blood vessels Of all the syphilitic lesions found in the post mortem rooms these are far the commonest in fact the proportion is so great that it may be

and that [illegible]

Again to [illegible] bone [illegible] upon [illegible] which have [illegible] in the walls of the [illegible] stage of generalization

II. General Pathology of Syphilis of the Nervous System

Syphilis of the nervous system differs [illegible] from syphilis in any other part of the body

In the early stages when the virus [illegible] throughout the body the nervous system is often involved The vessels of the pia matter of the brain and spinal cord are affected as in other parts of the body in fact it is common even to get a certain amount of cellular infiltration of the meninges, in other words a syphilitic meningitis and this may be detected in the cerebro-spinal fluid by an increase in the number of cells Headache is common in this stage of syphilis and definite signs of organic nervous lesions may often be detected Coincident with the appearance of the rash in the body a comparable lesion may occur in the meninges

This meningitis in the secondary stage of syphilis is of importance in connection with "606" treatment because if a reaction takes place in the meninges as may take place in the skin (Herxheimer) serious results may follow

During the acute period most of the spirochaetes which have invaded the nervous system are destroyed as in other parts of the body but some may be left and in any case those tissues which have been influenced by the spirochaetes in the acute stage will become sensitized If now an exacerbation of spirochaetes takes place in the brain "tertiary" lesions will develop but the clinical type of the "tertiary" disease will differ widely according to the part of the brain which is chiefly affected

It must be understood that the brain is an organ almost unique in the body in that any lesion which involves the nervous tissues is almost certain to lead to symptoms and further if an intoxication is sufficiently great to lead to the death of a cell its function will not be regenerate Large areas of kidney or liver tissue may be destroyed without causing symptoms and new kidney or liver cells may develop to replace those destroyed If however, in area of nerve cells becomes attacked they will degenerate and their function will be permanently lost The testicle is a similar organ An

[illegible] followed by atrophy and [illegible] function The presence of [illegible] nervous system results in [illegible] the tertiary period

[illegible] process is chiefly developed [illegible] capillaries perivascular spaces meninges &c

(*b*) That in which the inflammatory process is developed chiefly in the nerve tissues (nerve cell neuroglia &c)

The first type interstitial encephalitis (myelitis) the syphilis meningo vascularis of Head and Romanoff, includes all forms of cerebral syphilis gummatous meningitis syphilitic thrombosis and also many forms of myelitis

The second type parenchymatous encephalitis (myelitis) the syphilis centralis of Head and Romanoff includes paresis syphilis tabes dorsalis dementia paralytica and other more local affections of ganglion cells

The general pathology of these two types of disease is the same Each is originally due to an invasion of the brain in the tertiary stage of syphilis, leading to a local sensitization Some spirochetes are left in or around the walls of small blood vessels in the meninges while others have wandered farther afield and have penetrated into the nerve tissues If an exacerbation occurs in the meninges a local proliferation of cells takes place and produces the lesion known as gummatous but if the spirochetes are situated among the nerve cells also the latter will become intoxicated and having the power neither of proliferation nor repair they will degenerate and continue to degenerate in spite of all treatment to the uttermost limit of the neuron

As a result of this degeneration the function of a large number of nerve cells is irretrievably lost Some of these functions may be essential to continued existence and thus their loss will cause death sooner or later and this in spite of the fact that the syphilitic infection may have been cured

With regard to the meningo vascular lesions (cerebral syphilis) this degeneration does not at first affect essential tissues and therefore effective treatment will not only cure the syphilis but also the symptoms If on the other hand such a case is diagnosed as early G P I and suitable treatment is withheld the syphilitic process will spread and eventually involve the essential nerve tissues The man will then indeed suffer from G P I in the pathological sense as well as in the clinical sense

[illegible]

[illegible] Syphilis of the Nervous System

[illegible] is found [illegible] syphilis [illegible] The test does [illegible] [illegible] found that [illegible] is contained in [illegible] after [illegible] in the blood [illegible] of the [illegible] and blood contain [illegible] that [illegible] without [illegible] shows [illegible] in the cerebro spinal fluid [illegible] syphilis [illegible] with meningitis, whether syphilitic [illegible] positive reaction in the fluid. In most cases [illegible] including cases of meningitis due to [illegible] general it may be assumed that [illegible] Wassermann [illegible] the cerebro spinal fluid indicates syphilitic [illegible] of the central nervous system.

In practice the positive reaction is [illegible] and [illegible] when the spinal cord is involved. But in some instances [illegible] cerebral lesions the reaction in the fluid taken from the lumbar region may be negative. The test unfortunately does not in any way differentiate between meningo-vascular syphilis and central syphilis. The reaction is, of course, primarily due to the meningeal inflammation, but meningeal inflammations are practically always present in central lesions. Tabes dorsalis for instance is almost always associated with a meningitis.

The only satisfactory way to deal with this question is to apply the test of treatment.

The Treatment of Syphilis of the Nervous System

In discussing the treatment of these conditions we of course refer to treatment by salvarsan or its approved substitutes. In passing it may be mentioned that *galyl is not an approved substitute*. This is a very inferior drug which was taken up only when the supply of neo salvarsan ran short after the outbreak of war and when most practitioners found themselves unable to cope with the old salvarsan.

The treatment of these diseases presents problems of great interest. The meningo-vascular type is resolved rapidly, as is a

gummatous lesion in other parts of the body, but in [illegible] of lesion is resistant to treatment to a variable degree [illegible] reasons —

Firstly, the treatment may in fact have been successful [illegible] by the examination of the cerebro spinal fluid but the [illegible] continue because these are due to nerve degeneration [illegible] of course uninfluenced If the loss of the nerves [illegible] sistent with continued life it may be possible by treatment to prevent the involvement of other nerves and thus the [illegible] preserved as a normal member of society It is [illegible] marked improvement is obtained by treatment [illegible] after a time the disease appears to be more [illegible] Wassermann reaction may rapidly become less [illegible] spinal fluid but it will not become entirely negative [illegible] usually to the resolution of the accompanying [illegible] lesion leaving a central lesion unaffected

Secondly when a man dies after a dose of [illegible] animal is injected and killed arsenic is found in all [illegible] the body except the brain and cord The inability [illegible] to penetrate into the brain is shared by certain [illegible] by comparing those which penetrate with those which [illegible] has been found that the factor which governs [illegible] factor of solubility in chloroform A chloroform [illegible] ding had been prepared at the London Hospital and [illegible] to penetrate into the brain, when the work was [illegible] to the outbreak of war

SECTION II—CLINICAL NOTES ON CASES OF SYPHILIS OF THE NERVOUS SYSTEM BY DR HILDRED CARLILL

The following classification of syphilitic [illegible] based upon the clinical work of Dr Head and Dr [illegible] lished in conjunction with the pathological work of Dr [illegible] and Dr Tilles

(1) Secondary Syphilis of the Nervous System
  Meningo vascular
(2) Tertiary Syphilis of the Nervous System
  Meningo-vascular Syphilis of Brain and Cord
  Syphilis Centralis
    (a) Tabes Dorsalis
    (b) Dementia Paralytica
    (c) Taboparesis.
    (d) Syphilitic Muscular Atrophy

Secondary Involvement of the Spinal Nerves and Ganglia

These cases do not differ in any pathological respect from those in which the cranial nerves do not happen to be involved. It is convenient for reference to distinguish them. On a purely pathological basis there may be grounds for a subdivision of tertiary syphilis of the nervous system into meningo-vascular and parenchymatous, but in clinical practice it is usually impossible to draw a line between them.

The term "involvement of the cranial nerves" is used to denote either a localized meningitis or to a syphilitic periostitis of the base of the skull, which is followed by a secondary degeneration of the nerve. It is noteworthy that whereas treatment rapidly brings about a diminution or cure of the general meningitis, the cranial palsies seldom recover completely while the patient is under observation.

Several cases of this variety of syphilis of the nervous system have come under observation. In some of them there was evidence also of involvement of the spinal cord.

The following case illustrates the rapid involvement of the nervous system after infection with syphilis.—

Case 1.—A. J., aged 30, who admitted gonorrhœa in 1905, but who denied that he had syphilis, was married in December, 1916, and remained well until March, 1917. He then developed "double vision" and headaches which disturbed his sleep. He had been operated upon for infection in January, 1916. During January, 1917, a month before he asked for treatment on account of a scattered red rash over the trunk and abdomen. His blood was not tested, but he was given injections of 0·1 gram galyl in a hospital ship. After the first injection the rash disappeared.

He was admitted to Haslar in April, 1917, on account of the severity of the headache. He was found to have paresis of the third cranial nerve on the right side with ptosis and diplopia on looking downwards and to the left. His ankle jerks were absent, but the central nervous system was otherwise normal. He showed no evidence of syphilis. The Wassermann reaction of the serum and cerebro-spinal fluid was strongly positive, and the fluid contained 1,200 lymphocytes per cubic millimetre and an excess of globulin. By May 17 he had received seven full doses of 0·01 gram galyl in addition to mercury. After the first injection his symptoms improved very considerably, and on April 29 his cells had decreased to 10 per cubic millimetre. The Wassermann reaction of the fluid was still positive in 0·2 c.c., but negative in larger dilutions of fluid. The ankle jerks were absent as before. On May 16 the fluid contained eight lymphocytes per cubic millimetre and the Wassermann reaction was negative in 0·2 c.c., but positive in 1 c.c. of fluid.

The clinical improvement in this patient [illegible] The improvement in the pathological condition [illegible] hope that further treatment on the same lines will [illegible] of the syphilitic lesion of his nervous system

The assumption is that he was infected in December 1916

Of the remaining cases there was another example of complete paralysis of the third cranial nerve and one of bilateral affection of the sixth nerves with onset about six months after infection in each case In the former the Wassermann reaction became negative in the fluid after three injections of 914 and under the lymphocytosis had cleared up

Another patient had paralysis of the seventh and eighth cranial nerves on one side nine months after infection He received two full doses of kharsivan during the fourth and fifth month after his chancre appeared but when he came under our observation the Wassermann reaction of serum and fluid was strongly positive and there were 300 lymphocytes per cubic millimetre in his fluid

A fourth patient developed paralysis of five cranial nerves on one side He denied syphilis The Wassermann reaction of the serum was positive but the cerebro spinal fluid was normal in every respect

The following is a good example of the danger of relapse which the patient runs if treatment is stopped as soon as the Wassermann reaction, which was previously positive becomes negative In this case the patient was fortunate enough to have a visible lesion and attention was called to his condition before the disease had progressed too far He was able to continue treatment at home with very satisfactory results

Case 1914 —T H aged 30 stoker, developed a chancre in November 1916 which was followed by a rash During January, 1916 he received at Haslar three injections of 0 45 gram 914 At the end of this treatment the Wassermann reaction of the serum was still positive and he was told to take mercury pills and to have his blood tested again in April On April 2 his Wassermann reaction tested at Haslar was negative The man was in good health, and he was told that he was cured

Two days later on April 6 he started to have severe pain over the left side of his head and on April 7 the left side of his face was paralysed He was admitted to Haslar on April 14 and came under our observation for the first time He showed complete paralysis of the seventh and eighth cranial nerves on the left side The central nervous system was otherwise normal The serum gave a positive reaction The cerebro spinal fluid was negative in 0 2 c c but positive in 0 5 c c and there There was a marked excess of globulin in the fluid and 100 lymphocytes and six polymorphonuclear cells were counted per cubic millimetre

[illegible] May 24 1917 [illegible] injections of 914 [illegible] His hearing [illegible] the facial palsy [illegible] proved The Wassermann [illegible] now negative in the [illegible] in the fluid in all dilutions There were eight lymphocytes [illegible] per cubic millimetre

[illegible] treatment is to be continued and the man will be instructed to [illegible] three months after his discharge for further tests

Early Meningo vascular Syphilis without Involvement of Cranial Nerves

[illegible] cases of this variety have been seen and of these three [illegible] positive Wassermann reaction in the cerebro spinal [illegible] the presence of a lymphocytosis The cells numbered [illegible] twenty four and seventy-four respectively In the latter [illegible] seventy-four cells per cubic millimetre infection [illegible] in March 1916 and the patient had received one [illegible] injection In September 1916 he had three attacks [illegible] success in one week The central nervous system [illegible] abnormality beyond some analgesia of calves and Achilles [illegible] he said that recently he had been unable to completely [illegible] his hat

[illegible] following case illustrates the rapidity with which the [illegible] cerebro spinal fluid may be made normal by treatment

[illegible] W D aged 21 fireman He contracted syphilis in [illegible] but no secondaries developed During March 1916 he [illegible] injections of 606 and Bismuth at a month's interval and [illegible] In this treatment he developed iritis of the right eye [illegible] 1916 for two weeks his head felt queer and he could not say what [illegible] he wanted to

He was [illegible] to Haslar on January 1 1917 with a syphilitic rash on the forehead and trunk He said that he had had this rash for two months He was weak and ill nourished The central nervous system [illegible] no abnormalities except that he had analgesia to painful pressure nearly all over He also had iridocyclitis on the right side The Wassermann reaction of serum and cerebro spinal fluid was strongly positive The fluid contained 150 lymphocytes and a few polymorphonuclear cells per cubic millimetre During the first three weeks of [illegible] he received four full doses of 914 After the second [illegible] the rash had disappeared The injections caused him no discomfort [illegible] was no evidence of reaction On January 20 1917 the Wassermann test of the serum was positive as before but the cerebro spinal fluid gave a negative test and contained no cells His general [illegible] greatly improved

The [illegible] importance of examining the cerebro spinal fluid [illegible] three months is well demonstrated by the case [illegible]

Case 153 2—W. T. aged 28. Contracted syphilis in September 1915. He received two injections into a vein and two into the buttock before he was admitted. In December 1915 he developed severe and constant headaches. On admission to Haslar in February 1916 he showed no evidence of neurological disease. His headache was severe and was not relieved by mercury or iodides. His pulse was slow and he vomited occasionally. On account of the Wassermann reaction of the serum being returned twice as negative the medical officer in charge of the case looked for some other cause than syphilis to account for the signs. It was even suggested that he should be transferred to the mental ward as the severity of the headache had made the patient rather difficult to deal with.

On March 10 1916 his cerebro spinal fluid was found to contain no less than 1 000 lymphocytes and 500 polymorphonuclear cells per cubic millimetre. The Wassermann reaction in serum and fluid was strongly positive.

The following day he received 0 2 gram Arsphenamin which gave him almost immediate relief. He received two more injections of 0 2 gram and 0 3 gram and by the end of March he felt and looked a different man. The Wassermann reaction of the serum was now negative and he was discharged to duty on April 4, 1916. He was told to attend for further treatment if possible. His serum gave a positive Wassermann reaction just before his discharge. The cerebro spinal fluid was not examined again.

During November 1916 he received three injections of galyl in Gibraltar and he remained fairly well until March 1917 when he had an attack of transient hemiparesis with affection of his speech. He described this as a stroke. He was again admitted to Haslar on March 29 1917 but he showed no evidence of nervous disease and he was not lumbar punctured. The serum gave a positive reaction. He looked well and had no headache but he said that he did not feel quite himself. He was given a series of small doses of 914 during April and May and he still under treatment. On May 21 1917 we were asked to examine the cerebro spinal fluid. Globulin was in excess and there were eighteen lymphocytes per cubic millimetre. The Wassermann reaction was positive in 0 5 c.c. of fluid but negative in larger dilutions.

We are forced to the conclusion that this patient might well have been cured during the fifteen months which have elapsed since he first came under observation—if the disease had received adequate treatment.

A somewhat similar case is that of a patient who for three weeks prior to his admission in May, 1917, had suffered from severe headaches. He ascribed this to an injury received by an oil can falling on his head and causing a scalp wound. He was admitted to a surgical ward, but as no sufficient surgical cause for the headache could be made out his Wassermann reaction was tested and proved positive. The man admitted having had a sore in December 1916, and for this he had received six injections of galyl

in March 1914. The most careful examination of his nervous system disclosed no abnormality, but the cerebro spinal fluid contained nearly 600 lymphocytes per cubic millimetre and gave a strongly positive Wassermann reaction. His headache and general drowsiness were improved by the first injection of '914, and now at the end of a fortnight, during which time he had received four full doses of the drug, the cells decreased to 140 per cubic millimetre and he said that he felt perfectly well again.

After twelve full doses of '914 given intravenously the cerebro spinal fluid gave a negative Wassermann reaction in all dilutions, from 0·1 c.c. to 1 c.c., and the cells had been decreased to 40 per cubic millimetre. The Wassermann reaction of the serum was positive still.

In this type of case immediate treatment is essential. It is the work of a few moments only to perform lumbar puncture and determine the existence of a lymphocytosis. Excess of cells in cases such as we have described points to a syphilitic involvement of the nervous system almost certainly, and there should be no delay in commencing treatment merely because the Wassermann reaction is not known.

In a number of cases of this kind we have found that the Wassermann reaction is negative when the test is performed with the usual quantity of fluid, namely 0·2 c.c., but positive in 0·1 c.c. and in 1 c.c.

Case 253.—A. M., aged 24, stoker, contracted syphilis during 1913 and received two injections of kharsivan at an interval of many months. In January, 1916 he was seized with paraplegia and incontinence. The serum gave a positive reaction. The fluid was not examined. Later he came under our care. His paralysis was almost complete, and he had a foul anomalous bed sore on his buttocks. He was given seven injections of kharsivan, and by August 1916 he was able to walk fairly well and the sore was healed. Throughout August, September and October 1916 the serum was repeatedly found to be negative, and when the fluid was examined for the first time in October it was normal in every respect.

Tertiary Meningo vascular Syphilis of the Nervous System

Some twenty five cases of this type have been observed. This include cases which would have progressed rapidly to an incurable stage, in the absence of accurate diagnosis and treatment. Doubtless some will so progress in spite of treatment. We include in our series the cases of hemiplegia from syphilitic cerebral vascular lesions and we may here remark that of eighteen cases of hemi

plegia due to all causes, of which we have the full notes, eleven were proved to be syphilitic The average lymphocytosis of those cases which gave a positive reaction in the fluid was about thirty cells per cubic millimetre

There is no sharp differentiation between meningo-vascular and central lesions in tertiary syphilis of the nervous system The precise pathological condition depends upon the varying sensitization of the tissues In several of our cases of tertiary meningo vascular syphilis the lesion was really mixed in type

The following case is an example of mixed tertiary syphilis with acute onset —

Case 139 3 —R D, aged 30, A.B contracted syphilis in 1906 and received mercury treatment for two years Ten years later in 1916 while he was being examined with a view to having an operation on his varicose veins he was noticed to be slightly defective mentally On admission to Haslar in September, 1916 he said that he felt perfectly well but his articulation was noticed to be impaired and he was unduly emotional We learned that he had been extravagant recently with his money and also that his sexual power had declined In the ward he showed a tendency to overdo everything in speech and action He was jumpy loquacious and tremulous His pupils were Argyll Robertson in type and the ankle jerks were absent There was marked amelgesia of his Achilles tendons and of his testicles

The Wassermann reaction was strongly positive in serum and cerebro spinal fluid and the latter contained 140 lymphocytes and 148 poly morphonuclear cells per cubic millimetre After six injections of kharsivan the cells were reduced to ten lymphocytes only

In May, 1917, we heard that he was able to do his work in a London post-office satisfactorily

Case 14 4 —W B aged 46, developed hemiplegia of face arm and leg in November 1916 He contracted syphilis at the age of 21 and twenty years later he had a large gumma on the right thigh On admission the serum and fluid gave a strongly positive Wassermann reaction and the fluid contained forty six lymphocytes per cubic millimetre During November 1916 he was given two full doses of kharsivan and one of '914 In May 1917, he came up to see us There was no weakness whatever on the previously affected side, and he was able to do hard work The serum gave a positive reaction, but that in the fluid was now *negative* in all dilutions The fluid contained ten lymphocytes per cubic millimetre The opportunity was taken to give him a further injection of '914

The last case of this type which we quote is one of extreme importance because the precise condition of the patient was at first not determined, and he was in consequence certified insane and sent to Yarmouth He recovered so much under treatment that at the time he went there he had become sane

A naval officer aged [illegible] series of delusions [illegible] August [illegible] [illegible] stated that he could see [illegible] of submarines [illegible] imagined that he was receiving [illegible] calls in the [illegible] On admission to Haslar in August 1916 the Wassermann [illegible] was strongly positive The cerebro spinal fluid [illegible] He recovered to some extent and was sent on leave [illegible] was given In October, 1916 he came under our [illegible] He was very strange in his manner and on one occasion [illegible] into the coal box He had marked delusions of [illegible] The ankle jerks were very sluggish and there [illegible] to pin pricks He was diagnosed as a case of early dementia [illegible] and certified before the cerebro spinal fluid had been [illegible] When this was tested it gave a *negative* reaction but contained [illegible] lymphocytes per cubic millimetre

After [illegible] months in Haslar he had improved out of all knowledge and was [illegible] free from delusions and absolutely sane We urged that the continuation should be cancelled and that he should be kept in Haslar to continue his treatment but it was decided that he must go to his home He was discharged from that institution in February, 1917 and the Fleet Surgeon in charge very kindly wrote to us saying that the patient had been in good mental health during his stay there

Tertiary Syphilis Affections of the Nervous System

Tabes Dorsalis—Forty six cases have been under observation and of these six had neither the serum nor the cerebro spinal fluid examined In three other cases the serum gave a positive reaction but the fluid was not examined In six cases the serum and cerebro spinal fluid gave a negative reaction These will be referred to below Of the remaining cases one gave a negative serum which was confirmed in the serum but the reaction in the fluid was positive and there was a lymphocytosis. Three gave a positive serum reaction but a negative reaction in their fluid lymphocytosis was present in two of these cases One of them had received modern treatment The rest of the cases gave a strongly positive Wassermann reaction in serum and fluid with a lymphocytosis

In several instances we have seen patients whose serum has been reported negative at other hospitals, but who gave a positive reaction at Haslar

The age of the patients varied from 28 to 65 except in the case of two patients with juvenile tabes dorsalis aged 19 and 21 respectively

The cell content of the fluids varied from 10 to 216 lymphocytes per cubic millimetre These figures refer to the cytology before treatment In no case which we have examined has treat

[illegible]

[illegible]

[illegible] absent [illegible] jerks slugg[illegible] In the [illegible] were all al[illegible]

In the [illegible] the pupil [illegible] analgesia [illegible] analgesia [illegible] only [illegible] doubtl[illegible] [illegible] topotomy [illegible] doubtl[illegible] [illegible] been treated [illegible] [illegible] for it was [illegible] [illegible] had [illegible] [illegible] intestinal obstr[illegible] [illegible] had [illegible] [illegible] days He rebl[illegible] [illegible] anesthesia [illegible] in order that [illegible] [illegible] Muscle wasting has not been [illegible] [illegible] In only [illegible] instance had the patient [illegible] [illegible] under observation

All the men w[illegible] [illegible] to the [illegible] of their admission [illegible] was done to the onset [illegible] their symptoms is [illegible] difficult to det[illegible] but we think that the evidence points to the fact that the War has precipitated the illness in many cases

It is impossible to determine accurately the time which has elapsed between infection and the first [illegible] symptoms for in many cases there is no doubt that infection did not occur at the date given by the patient There can be no question that the signs of tabes dorsalis are present long before the symptoms and it is in the Navy particularly that these signs can and should be detected by routine examination of the nervous system Rheumatism and sciatica remain as in the past common errors of diagnosis

In our experience intravenous injections of "606" are very valuable for the relief of lightning pains and also for their tonic action on the body generally and on the sexual organs in particular Impotence and nocturnal emissions both very worrying to the patient, have frequently improved by this treatment

The following are the notes of a case of tabes dorsalis in which

the syphilitic infection had died out without treatment We have seen three such cases In all of them a slight excess of cells in the cerebro spinal fluid was the only pathological evidence of their disease

Case 1 of 1 —W P , aged 51, had been impotent for two years For ten years he had been troubled with lightning pains and for nearly twenty years his knees had been getting deformed He was found to have Argyll Robertson pupils with optic atrophy of the right disc He had Charcot's disease of both knees and one wrist His ankle jerks were absent There was no abnormality of cutaneous or deep sensation but he had no knowledge of the position of his lower limbs, at any joints The Wassermann reaction was negative in serum and cerebro spinal fluid but the latter contained six lymphocytes per cubic millimetre and excess of globulin

In another patient aged 14 the Wassermann reaction was positive in the serum, but the cerebro-spinal fluid was normal in this respect He admitted syphilis at the age of 19, but he had never received any particular treatment He presented the classical signs of tabes dorsalis and there was direct evidence that eight years previous to our examination his pupils were unequal and dull to light

Another patient who showed all the signs of the disease and in whom locomotor ataxia was a marked symptom, had a weakly positive Wassermann reaction in his serum The cerebro-spinal fluid gave a negative reaction with excess of globulin and forty eight lymphocytes per cubic millimetre

The following case is of special importance for it shows the direct result of treatment on a case which was diagnosed tabes by Dr Head five years prior to our examination

Case No 3 —I T aged 36 a driver in the R M A was admitted to Netley in October 1916 on account of inability to drive his howitzer at night in the dark He denied venereal disease The pupils and cranial nerves were normal His knee and ankle jerks were absent The soles of his feet alone showed cutaneous sensory loss but his calves and Achilles tendons were insensitive to firm pressure There was a callus under beneath the left great toe The sphincters and sexual functions were normal He was much troubled with lightning pains those relieved by cannabis indica The serum and cerebro spinal fluid were absolutely normal

In 1917 he was under the care of Dr Head at the London Hospital with the signs and symptoms He received two doses of 0 9 grm salvarsan His Wassermann reaction at that time was strongly positive in his fluid and slightly less positive in the serum He had received no further treatment

W[illegible] to Dr Hall for [illegible] shows that treatment will [illegible] to the [illegible] syphilitic disease of the [illegible] the result of nerve degeneration [illegible] but not cured

Tabes [illegible] — The only material distinction between [illegible] of demented paralytics [illegible] in the former In demented paralytics [illegible] usually exaggerated Light cases [illegible] Their age varied from 28 to 52

In one patient the knee jerks and one ankle jerk were [illegible] while the other ankle jerk was absent One [illegible] had [illegible] disease of a knee joint In six cases the serum and [illegible] fluid gave a positive Wassermann reaction and the [illegible] a lymphocytosis Of the other two cases the serum was [illegible] in one but the fluid was not tested while in the [illegible] the fluid gave a positive reaction and a lymphocytosis is but the [illegible] reported to be negative

Two patients were sent to Yarmouth and two were [illegible] home One patient died in the hospital from [illegible] No autopsy was obtained

Dementia paralytica —Twenty eight cases have been [illegible] The Wassermann reaction of the serum was strongly positive in every case Of the twenty-six cases which were lumbar punctured all gave a strongly positive reaction in the fluid The pressure of the fluid was never increased The lymphocytes, as noted before treatment, numbered from 22 to 160 per cubic millimetre [illegible] The age of the patients varied from 28 to 50 and no less than [illegible] were 31 or under Eleven patients were certified and [illegible] asylums The rest went home One case was associated with ununited fracture of the tibia

The facial expression had undergone alteration from the normal in all but two cases Previous photographs of the patient were examined in nearly all cases

In two patients the knee and ankle jerks were normal In the remainder the tendon reflexes were exaggerated but in no case were the plantar responses extensor except during or for a short time after a fit

Fits occurred in six cases One of our patients was admitted in a fit, and two others had attacks while they were under observation

Delusions have been comparatively infrequent In all but six cases the articulation was impaired In only one case was any

[illegible] liability whereas impair[illegible] only [illegible] avid

[illegible] occurred in many cases during [illegible] treatment Pathological evidence of improvement is shown by the decrease in the cell content of the cerebro spinal fluid

It is difficult to bring forward any certain evidence that the train of work has precipitated the onset of symptoms but in many [illegible]tances there was reasonable cause for thinking that this was the [illegible]

The following two cases are worthy of note The first shows how rapidly the disease may prove fatal the second how difficult [illegible] to give an accurate prognosis in certain cases

[illegible] 49 1 —Albert F, aged 41 colour sergeant R M L I was [illegible] to Hasler in December 1916 with a history that for two weeks [illegible] had been making silly mistakes in his work He presented well [illegible] signs of dementia paralytica became rapidly worse, developed [illegible] and died at Netmouth in February 1917 just over two [illegible] after the state of his health first attracted attention The Wassermann reaction was positive in serum and fluid and there was a [illegible] lymphocytosis of eighteen cells per cubic millimetre

[illegible] 77 1 Edward P aged 41 leading stoker R F R was admitted [illegible] March 1916 with well marked signs of dementia paralytica Both [illegible] fluid gave a positive Wassermann reaction and there were [illegible] lymphocytes per cubic millimetre in the fluid Eight years pre[illegible] had been certified insane from the same disease and had spent [illegible] years at Netmouth During 1914 he had been for seven months at [illegible] system for the same reason

[illegible] with emphasizing the fact that when death occurs [illegible] has been examined a specimen of the serum [illegible] obtained by puncturing the heart with a needle and [illegible] blood with a syringe The operation should be per[illegible] after death has occurred Similarly death is no [illegible] for omitting to examine the cerebro-spinal fluid

[illegible] of the importance of this method of accurately [illegible] the cause of death has occurred recently in the practice [illegible] colleagues A man aged 27 was admitted in an [illegible] with the history that he had been taken ill [illegible] previous day while at work At first he was con[illegible] case of cerebral haemorrhage while a later opinion [illegible] he was suffering from acute cerebro-spinal fever The [illegible] spinal fluid was examined for organisms with a negative [illegible] Syphilis was then suggested but the patient died the follow[illegible] before any definite diagnosis had been made Some serum

and fluid were collected [illegible] after death. The Wassermann reaction was strongly positive both and the fluid contained [illegible] lymphocytes per cubic millimetre. The autopsy did not disclose any macroscopic cause of death. The brain was kept for examination for spirochaetes.

Muscular Atrophy.—In [illegible] localized muscular atrophy in a tertiary syphilis have [illegible] but they are not common.

Case 183.—R. S., [illegible] developed pains across the shoulders in February 1916, and in [illegible] Dec. he had lost the power in his hands, and complained of [illegible] numbness in them. Syphilis, twenty years before, was [illegible] treatment in October 1916 he was found to have wasting of the muscles of each hand and also of the muscles of the right upper [illegible]. The reflex and sensory systems were normal. The pupils were small, unequal and Argyll Robertson in type and [illegible] were pale. The Wassermann reaction was strongly positive in the fluid and there was a lymphocytosis of twenty one cells per cubic millimetre.

Section III.—The Technique of Lumbar Puncture.

This operation has been performed on 240 patients in one hundred cases more than once and in [illegible] three or four times. In all cases a provisional clinical diagnosis has been made before the cerebro spinal fluid has been examined. The Wassermann reaction of the serum and fluid has been controlled in every case by Dr. Fildes, and the cytological examination of the fluids has been done either by Dr. Baker or the writer using the same method.

The technique of the operation has been the same throughout. Nearly every patient has been punctured sitting on a chair. A few patients with mental disease have had a previous hypodermic injection of morphia and scopolamine. The site of operation is cleaned with ether and sprayed with chloride. Lumbar needles of platinum-iridium are used and have always prepared. The word 'needle' is not mentioned and the patient is not allowed to see them. A small glass syringe [illegible] is a handle for the syringe, it serves also to wash the needle through after the operation is completed. The puncture is made *below* the fourth lumbar spine for this reason: if a vessel is injured the needle can be withdrawn and inserted at a higher level where in most cases, especially when the patient is sitting up, the fluid will be found uncontaminated with blood. With fine sharp needles however blood is seldom met with. It is of the first importance in microscopical work to obtain a fluid which is free from blood although

[illegible] small quantity of [illegible] [illegible]tly interfere with [illegible] [illegible]ytological examination [illegible] Wa[illegible] test

A successful p[illegible] [illegible] in strict attention to [illegible] details The pa[illegible] [illegible]ted during the operation Several sterilized [illegible] tubes [illegible] in readiness After the fluid has been withdrawn the wound is sealed with collodion or plaster The operator should himself clean his needles after use by washing them through first with water and then with spirit No untoward symptoms have followed the operation In very many cases the patient has said frankly that he did not feel the slightest pain or discomfort during the puncture The patients are always advised to lie down for a few hours afterwards, so as to avoid a headache. This possibility should always be mentioned to them They bear a headache with far less concern when they have been warned of its possible occurrence In only one of our cases was the headache so severe that the patient was unwilling to have a second puncture It is our custom for patients to come to our ward from their own wards and to walk back after the operation Time is saved by doing several operations at a sitting, and we have done as many as ten operations in this way in thirty minutes

A small quantity of fluid is collected into two sterile test tubes These are labelled immediately One specimen is tested at once for globulin If the test is positive we know that we are dealing with an abnormal fluid The second specimen is taken to the laboratory and put into the ice chest until it can be examined Examination comprises (1) the detection and enumeration of cells (2) the Wassermann reaction The cells should be counted within twenty-four hours as after this time they tend to disappear A fluid which is slightly stained with blood is always useful for the Wassermann reaction, but the fact that it contains blood must be remembered when the result of the test is read off

The method which we use for counting the cells is described later The only requirements are an ordinary hæmocytometer, a graduated pipette a bottle of stain and a microscope with a one sixth inch objective and a movable stage

Opinions differ as to the desirability of lumbar puncture being performed only by an expert This is due largely to the fact that so few medical men have made themselves proficient in the operation The science of neurology is dependent on the examination of the cerebro spinal fluid, and in general medicine it is frequently of the very greatest importance The risk of septic

infection, if it is remembered is practically negligible. We [illegible] met with no case in which there was any undue difficulty [illegible] operation or in which it was contra indicated.

We take this opportunity of acknowledging the help given [illegible] us in our series of operations by Sister E. E. Saddington and [illegible] by Sick Berth Stewards H. Smith and C. Vernum.

Technique of Intravenous Injections

During the year we have given many hundreds of injections of "914." A course of treatment consists as a rule of five [illegible] injections at half weekly intervals. Full doses are used in most cases. The co operation of the patient is always obtained and he is asked to sign a statement saying that he is willing to have the treatment which is recommended.

For a time we used galyl but its use was abandoned as soon as we could obtain a supply of "914." Some thirty injections were given. *We consider that the treatment of syphilis by galyl and "914" is obtainable is not in the best interest of the patient.*

Injection of "914" (Neosalvarsan or N. A. B.).

This drug is readily dissolved in the syringe in 10 c.c. of distilled water which has been sterilized in the autoclave. The piston is pushed home until the solution is just short of the needle point. By this means the drug is prevented from reaching the tissues if the vein is not punctured successfully.

The needles are kept in olive oil in a crucible. Directly before use the oil is heated to a temperature of 140° C. and allowed to cool. It is important to be sure that the needles are covered entirely by oil while it is being heated. After the injection has been made the needle is washed through with water and then with ether and returned to the oil bath. If water is allowed to mix with the oil there may be trouble when the latter is heated.

In order to distend the vein the armlet of the sphygmomanometer has been found successful. The portable instrument known as the "Tycos" has proved satisfactory in our hands. The armlet is distended to such a degree that the radial pulse is just not obliterated. In this way the venous pulse is obstructed to the greatest advantage. It is important that the armlet should not be applied so as to grip the arm too tightly. The pressure should be exerted by the air in the armlet and not by the armlet itself. Neglect of this precaution may result in blood escaping from the

vein when the needle is withdrawn whereas in a successful puncture a little blood should escape If the veins do not stand out sufficiently brisk friction of the skin with lint soaked in ether will usually cause them to become prominent The skin is cleaned at the same time The very superficial veins however will distended are not so easy to puncture as those which are supported by the tissues Fixation of the vein is best affected by drawing on the distal portion of the vessel The injection should be made slowly A little air in the apparatus has been found to do no harm whatever It has not get driven into the vein and even if a small quantity did enter no ill effects would be experienced by the patient In a few cases in which the drug has penetrated the tissues slight local reaction has occurred but this has in no case proved serious On withdrawal of the needle the wound is covered with gauze and massaged for a moment

The patient is kept in bed for about two hours after the injection No special precautions are taken as regards food either before or after the injection None have been found necessary nor has the customary preparation for operation The patient has of course, been examined thoroughly at the time the diagnosis was made It must be recollected that this account deals with cases of syphilis of the nervous system and not with acute early lesions

In no case has a successful venipuncture been followed by any disquieting symptoms nor have the few unsuccessful punctures caused any anxiety Lumbar puncture and intravenous injection are often received by the patient within the hour

As in lumbar puncture operations so in the case of intravenous therapy a personal control of the technique repays the operator many times over for the little extra trouble which he takes by the mental comfort which is assured him It is our habit to have an oxygen apparatus ready in the ward for instant use A draught of sal volatile and a hypodermic injection of caffeine are also prepared None of these remedies however has been needed

Injection of 606 (*Kharsivan*)

For the injection of this drug which we used in about 120 of our early cases we found the apparatus devised by McIntosh and Fildes the most useful It is sterilized in the autoclave For the jar which contains the solution and into which the cork has to be fixed by tying it in, we have substituted a glass jam pot with a screw top which fits over the cork and fixes it immovably The

[illegible]

[illegible] alkalinity [illegible] 0.9 per cent. [illegible] than 100 c.c. for the [illegible] Attempts to dissolve the [illegible] be satisfactory. The alkalinity of the [illegible] by allowing a drop to [illegible] The latter should turn red [illegible] important to follow some strict routine [illegible] Mistakes will then not occur. [illegible] as chemical compounds in solution [illegible]

The manner in which the [illegible] the greatest importance. It should be [illegible] so that it contains no organisms. It must [illegible] in the interior so as to prevent the growth of [illegible] which may have contaminated the water during its [illegible] The flask should now be sealed at once. Water which has been prepared in this way may be kept fit for use indefinitely.

Intrathecal injections [illegible] Chemotherapy

We have employed these injections [illegible] of [illegible] paralytics and in two cases of secondary syphilis of the central nervous system, doses of [illegible] gr. or [illegible] gr. in 10 c.c. of [illegible]. In the [illegible] cases vigorous reactions resulted [illegible] within the hour and [illegible] was rapidly [illegible] by an admit of any definite statement [illegible]

We have not used intrathecal injections [illegible] serum. Our experience of it before the war [illegible] that it had any advantage, to the patient over ordinary [illegible] injections of salvarsan. We have no experience [illegible]

Section IV.—Notes on the Wassermann Reaction and on the Examination of the Cerebro-spinal Fluid.

A positive Wassermann reaction [illegible] indicates active syphilis in the body. A positive W.R. in the cerebro-spinal fluid (c.s.f.) [illegible] of syphilis of the nervous system.

In syphilis (and parasyphilis so-called) of the nervous system the serum and c.s.f. usually [illegible] W.R. [illegible]

[illegible] especially [illegible] although the c s f is pressure [illegible] [illegible] This was the case in one of our [illegible] of patients with tabes dorsalis The diagnosis of these cases depends the effort upon the findings in the c s f and this fluid should always be examined when there is the slightest suspicion of syphilitic affection of the nervous system

The examination of the cerebro spinal fluid comprises (1) the Wassermann reaction (2) investigation of inflammatory products namely, cells and globulin

The W R is performed on the c s f in the same manner as upon the serum slight modifications only in the technique being necessary Five c c or so of fluid collected in a test tube is sufficient for all investigations Absolute bacteriological sterility is not essential but if the fluid has to be kept for some time before the examination is made it is well to collect it into a sterile tube The admixture of much blood with the fluid may lead to error in cases in which the patient s blood gives a strongly positive W R

The Value of the Wassermann Reaction of the C S F

When performed by a reliable worker a positive W R in the c s f is practically conclusive evidence of syphilitic disease of the nervous system The only condition in which the c s f may give a positive W R in the absence of syphilitic nervous disease is that of a non syphilitic meningitis occurring in a patient with a positive W R in his serum (see previous notes by Dr Fildes)

With a few exceptions a negative W R in the c s f means that the nervous system has escaped syphilitic involvement though the W R of the patient s blood may be positive

In the following conditions the W R in the c s f may be negative although syphilitic disease of the nervous system is present

(*a*) Very early acute syphilitic meningitis during the secondary syphilitic stage

In these cases the patient may not have developed a positive W R in the c s f but the presence of a meningitis will be evident pathologically by excess of cells in the fluid, and if a further test be made a week or so later the c s f will be found to give a positive W R

(*b*) After treatment with salvarsan compounds the c s f may become negative, but if adequate treatment is not continued a positive reaction may again develop showing that the spirochetes

were not completely destroyed by the treatment and that they have again multiplied and produced [illegible]

(c) In long standing cases of tabes [illegible] the spirochaetes may die a natural death as it were and as there is now no actual syphilis but merely the results of past destruction of nervous tissue the W R will be negative (*vide* Case 175 4)

The Cell Content of the C S F

In health the c s f contains few, if any cells 0 to 5 per cubic millimetre may be taken as normal and these are mononuclear cells small lymphocytes with an occasional endothelial cell More than ten cells per cubic millimetre is definitely pathological and indicates a meningeal inflammation of greater or less degree according to the number of cells present

In nearly every case of active syphilitic disease of the nervous system the meninges (pia arachnoid) are involved to some extent hence there is always an increase of cells in the c s f The number of cells present varies from a slight increase of lymphocytes such as 12 per cubic millimetre often found in tabes dorsalis, to as many as 1 500 or more as may be found in acute syphilitic meningitis In these latter cases the cells generally comprise a considerable number of polymorphonuclear leucocytes in addition to the mononuclear cells

At the onset of a syphilitic infection of the nervous system the increase of cells in the c s f appears before the W R becomes positive and a fairly definite diagnosis may occasionally be made before the development of a positive W R in the fluid This will be confirmed by the subsequent appearance of a positive W R in the c s f (see previous note on early syphilitic meningitis) In cases in which the disease is subsiding under treatment the disappearance of cells from the c s f is the first indication of improvement

The estimation of the cell content of the c s f yields information therefore which is hardly less valuable than the W R in this fluid, and unlike the W R, it is quite easy to perform and demands very little apparatus Thus the clinician can undertake it himself and gain early and useful information in cases where laboratory assistance is not at once available

The Technique of Cell Counts on the Cerebro-spinal Fluid

The fluid must be examined soon after withdrawal, within twenty-four hours, since the cells disappear on keeping It is impossible to make an accurate count if the fluid contains much

blood. A mob[illegible] deducting one h[illegible] cells per cubic millimeter.

The following [illegible] Apparatus required. [illegible] form of [illegible] a bottle of stam[illegible] of thoroi[illegible]

The test tube [illegible] the [illegible] four parts of fluid [illegible] removed and [illegible] part of stam[illegible] of fluid [illegible] pipettes. A small pipette can be [illegible] piece of glass tubing and marked [illegible] The [illegible] containing the mixed fluid and [illegible] is now shaken [illegible] warmed to about 37° C. by passing it through the flame of a Bunsen burner or of a spirit lamp. The temperature is estimated with the hand. Allow the mixture to stand for a minute or so and then place a drop in the counting chamber of the hæmocytometer and adjust the coverslip as in doing a blood count.

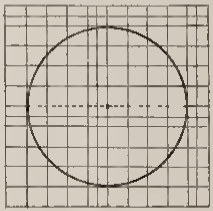


Diagram showing the field of [illegible] of the hæmocytometer.

Owing to the comparatively small number of cells in the [illegible] of those lying on the ruled area of the slide alone is insufficient to give an accurate result. The following method which is used by many persons for counting leucocytes is therefore adopted.

The method consists in adjusting the tube of the microscope so that a field of known area is obtained. A large number of fields can then be counted. They traverse the whole counting chamber and are not limited to the central ruled area. A larger volume of

fluid is thus covered, with a corresp[illegible] on the n[illegible] of the count

The ruled area of the Thoma Z[illegible] meter cons[illegible] sixteen large squares Each larg[illegible] into [illegible] small squares The side of a small [illegible] tube of the microscope is adjust[illegible] objective has a diameter equal to [illegible] square. (See diagram)

The area of the field is then [illegible] small squares (The area [illegible] $-\frac{22}{7} \times 16$, [illegible] 0 2)

The field of the [illegible] objective [illegible] the tube length u[illegible] being in the counting chamber the [illegible] out to the required length and fliv[illegible] The number of cells in fifty fields [illegible] ut cells per cubic millimetre

When one is familiar with the [illegible] length an accurate cell count [illegible] Should there be very few cells present [illegible] accuracy may be required and 100 [illegible] counted

Examination of the Cerebrospinal Fluid

The presence of excess of globulin [illegible] inflammatory exudate into the c s f and can always be d[illegible] in the presence of an increase of cells The test is carried [illegible] as follows an equal quantity of a saturated solution of ammonium sulphate is added to some of the fluid A bluish white cloudiness or precipitate is produced by globulin

We are in the habit of performing this test at the bedside on the first few drops of fluid withdrawn

An opinion as to the presence of excess of globulin in the fluid may be formed in many cases, by noting the amount of froth produced on shaking the test tube This test may be useful when a solution of ammonium sulphate is not immediately available

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[illegible] INVESTIGATION OF THE CARRIER PROBLEM IN THE PREVENTION OF CEREBRO-SPINAL FEVER WITH RESULTS OF EXAMINATION OF OVER 11,000 MEN (DECEMBER, 1916, to JUNE, 1917)

[illegible] W. BASSETT SMITH, C.B., F.R.C.S., M.R.C.P., R.N. [illegible] ROCHE LYNCH, M.B., B.S., R.N. AND [illegible] M.A.

[illegible] is and thorough examination has again been [illegible] Royal Naval College, Greenwich, for carriers of [illegible] the Naval Forces employed at and passing through [illegible] Naval Depot at the Crystal Palace. To a very great [illegible] visits have been carried out as during last year but [illegible] more examinations have been made. All men on entering the depot, and as many as possible of those about to be drafted out elsewhere, have been sent for the test to be carried out. Generally there were sixty on each morning, and on each afternoon on six days of the week.

The three investigators and the laboratory staff have remained unchanged during the period under consideration and therefore it has been possible to establish an efficient routine by which so much work could be the more easily performed. Experience has taught us that some slight modifications of the routine, as carried out last year, could be made with advantage, and that results could be obtained more quickly—a matter of importance when rapid drafting away of units is required.

The number of carriers detected has been considerable (676) and three points have been clearly established:—

(1) The percentage of carriers found this year has been much higher than during last season.

(2) If the men examined are divided into two groups, viz., new entries and drafts, the higher percentage of carriers has been found among the latter.

(3) The carrier stage has been much more persistent than was found to be the case last year.

The first two points show clearly when the percentages of carriers found during consecutive fortnights are plotted out as in the incidence chart of carriers.

From the average of 1 to 2 per cent. found last year (January

to July[1] the percentage of positives found among new entries increased more or less steadily up to the end of May. Since that date there have been indications of a decrease, probably due in part to the better climatic conditions prevailing.

INCIDENCE CHART OF CARRIERS FOR PERIOD JANUARY 1 TO MAY 26, 1917.

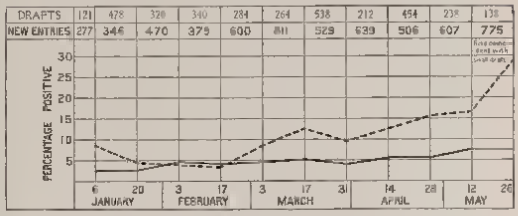


CHART 1.

It will be seen on the chart that the percentages have been taken from numbers well over 100—often several hundreds—so that the figures are fair and comparable. Occasionally there would be a particular batch in which the percentage of positives rose very high. This was marked in a number of merchant seamen undergoing special instruction, and drawn from Poplar, East Ham, Bermondsey, Tilbury and North Woolwich, when the high figure of 16 per cent. was reached. Possibly this was due to these men coming from poor overcrowded areas. With regard to the curve showing the percentage of positives among the men who had been some time at the depot and were to have been drafted out, the rise has been very much greater, and one cannot but recognize that a considerable amount of local infection has occurred.

The detected carriers have been completely isolated until they have given two consecutive results at weekly intervals. They are then allowed out to duty, but before being discharged they have to obtain in all four consecutive negatives. The weekly record shows how frequently these men give subsequent positive results, and are intermittent carriers. Necessarily these and other infected

[1] See p. 66 of the Medical Research Committee Report, 1917. Drafts leaving the Crystal Palace were examined, and these men contacts gave 0·976 per cent. negatives. The highest monthly percentage of positives was 2·2.

[illegible] associating with large bodies of men as are always present at a depot must tend to disseminate the organism, and so cause the higher incidence among the residents of the depot. This view is strengthened by the demonstration that a man who was originally segregated as a carrier of Gordon 2 type, later on was found to carry type 1, as shown in the following record: No. 2 [illegible] + (2), − − + (2), − + (1) + (1), + (1). Other records show similar changes of type.

The persistency of the carrier stage has been a very marked feature of these records. Of course, a large proportion of the cases [illegible] under Gordon's heading of "temporary carriers," i.e., one positive was obtained, the men were segregated, and by treatment or by normal processes they rapidly became free and four successive negative results were obtained. On the other hand, cases with five, [illegible] seven or nine positive results have occurred generally with [illegible] intermittency.

It has been decided that these very chronic carriers, if not clearing up in three months, are to be discharged from the service as they are a permanent danger to their neighbours, and would be more so if drafted to a ship or depot, where the prophylactic examinations cannot be made.

It has not been possible to determine whether there has been a local cause for the permanency of these infections. In a certain proportion chronic congestion of the fauces, enlarged tonsils or nasal catarrh, were present but we are convinced that these did not occur in anything like a large proportion of the carriers. It cannot be shown either that chronic carriers are most frequently found amongst the physically less well developed for the majority of the men were rather above than below the average for general healthiness.

The following table gives the frequency of positives found per carrier. The numbers refer to carriers detected among the first 11,000 non contacts examined and the record of their subsequent swabs is considered up to June 6, 1917.

Number of times found positive	1	2	3	4	5	6	7	8	9
Number of cases	459	126	49	23	13	3	2	0	1

The number of swabs taken in each case varies and many of the men were still under examination as they had not then obtained four consecutive negative results. It will be seen that the temporary carriers are far more numerous than all the others.

Including the examination of contacts, recovered cerebro-spinal

[illegible] cases [illegible] up to June 191[illegible] the [illegible] number of [illegible] which 1 103 giv[illegible]

Of the 11 000 [illegible] healthy [illegible] examined [illegible] positives were found [illegible] 11 per cent

The total number of cultures from these 11 000 cases in which the agglutination test was applied was 1 609 using Flexner's serum Of these 676 gave positive results, or 12 01 per cent

Occurrence of some types of swab records is given below —

+ + − − − −	53 of this type
+ + + − −	9
+ + + + − − − −	3
+ − + − − − −	19
+ − + − − − −	11
+ − − − + − − − −	11
+ − − + − − −	1
+ − + − + − −	3

Interesting examples of long records —

675 (D)	+ − − − − + − + − − +
2 574 (D)	+ − − + − + + + + + − + +
2 878 (D)	+ − − + − +
4 011 (D)	+ + − − − − − − − −
4 913 (D)	+ − − − − + + − + + −
5 526 (D)	− − + + − + − −
5 656 (D)	− − + + − − − − +
2 691	+ − − − + − − + −
1 474	− + − + +
3 728	− − − + − + − + − −
3 770	+ − + +
3 825	+ + +
5 560 (S)	+ − − − − +
6 [illegible]	− + +
6 [illegible] 864	− + − + −
6 913 (S)	+ + − +
6 770 (S)	− +
6 917 (S)	+ − + + +
7 142 (S)	+ + +
7 [illegible] (S)	+ − + − +
7 [illegible] (S)	− − − + + − +
7 420 (S)	− + + −
7 481 (S)	− + + −
7 702 (S)	− + +
8 042 (S)	− + + − −
8 070 (S)	− − +
8 196 (S)	+ + − − + − +
8 1[illegible] (S)	+
8 156 (S)	− + + − + −
8 163 (S)	+ − + −
8 555 (S)	+ − + +

(D) Discharged from [illegible] S [illegible] S [illegible]

From the 676 carriers [illegible] non contacts 881 examinations were made to determine the type of Gordon strain which was the causal organism The following results were obtained —

Gordon type	1	2	3	4
Number of times found	667	176	2	31

In five cases the cocci were agglutinated by both type 1 and type 2 sera

During the period under consideration there have been nineteen cases of the established disease so that we must look upon the carriers as the true index of the prevalence of the infection It has been urged that carrier work is of little value, owing to the inability in the light of our present knowledge to differentiate between pathogenic and non pathogenic strains of the meningococcus However in widening the net by improved technique &c to include isolate, and treat *all* carriers good work is being done to modify the incidence of the disease still seriously on the increase

As this year the total carriers have been shown to be far higher than last year and assuming that the ratio although unknown in figures, remains the same between pathogenic and non pathogenic strains, one hesitates to speculate upon what might have been the disease incidence if this isolation had not been carried out

A table is appended showing the number of cases each month and the results of examination of their contacts together with the figures referring to non contacts From this it appears that the highest incidence of cases occurred during the months of January March and April when the weather was exceptionally cold

[illegible]	Contacts			Non Contacts										Total [illegible]
	[illegible]	Total	Isolated	New entries	Total [illegible]	Per cent	Infective	Total [illegible]	Per cent	Officers	Total [illegible]	Per cent		
[illegible]	–		4	1 490	21	1 4	0	0	0	0	0	0		1 160
[illegible]	4	9	1	1 058	38	3 59	367	43	4 97	117	3	2 00		1 038
[illegible]	2	4	0	811	33	3 94	676	36	5 32	71	6	8 45		1 588
[illegible]	6	28	7	1 515	71	4 61	302	84	10 27	77	3	4 47		1 386
[illegible]	1	21	8	1 175	63	7 44	166	97	11 56	141	4	2 84		1 56
[illegible]	1	6	1	1 417	121	7 04	380	82	21 5	104	11	10 28		– 34
	13	96	19	19 8%	7 77	34	4 18	3 391	342	10 08	501	27	5 38	

[illegible] tested to the type [illegible] found in by far the [illegible] terminal fo[illegible] the same typ[illegible] form

Technique The swabs are rubbed by one officer (usually West [illegible]) and sown on plates these are then thoroughly spread by [illegible] and officer All the plates have sterile filter paper in the [illegible] to absorb excess of moisture thus keeping the colonies [illegible] possible discrete The plates are incubated for twenty four hours at 36° C and suspicious colonies are then taken and examined by Gram's method for correct morphology &c The colonies which have given correct morphology and colouration are inoculated into glucose and saccharose peptone serum water and incubated for forty-eight hours or until the presence of acid in glucose and the absence of acid in saccharose is demonstrated up to four days From all the glucose tubes whether showing acidity or not [illegible] the saccharose is not acid, a slope of trypsin legumin agar is inoculated and grown for twenty-four hours From these slopes emulsions in formalinized saline are made but we now use [illegible] phenol instead

All meningococci grown in this way should form good emulsions and if the growth does not emulsify it may safely be assumed that the organism is not a meningococcus

The emulsions are heated at 60° C for half an hour and tested for agglutination with Flexner's polyvalent serum at dilutions of 1 in 100 and 1 in 200 controls with normal serum 1 in 50 being employed The agglutination tubes are heated at 55° C for eighteen to twenty four hours and the results read off

Recently however we have inoculated the trypsin legumin agar slopes direct from the colonies on the plates, as with good agglutinating sera we believe the sugar reactions to be unnecessary for the following reasons (1) Glucose acidity is far too comprehensive (2) we have never found an organism which agglutinated with Flexner's serum at the dilutions mentioned which fails to give acidity with glucose or gives acidity with saccharose (3) a number of cocci some of which were in all probability meningococci died out in the sugar media and unsatisfactory negative results had to be returned Also no matter how careful one is the serum media occasionally becomes contaminated and a batch of results is spoiled (4) if inoculation direct on to trypsin legumin agar is performed from the plates only a very few organisms fail

to grow thus reducing the number of [illegible] returned We only cite the use of Flexner [illegible] we have found that a pure pathogenic menin[illegible] final find has failed to agglutinate with any [illegible] Gordon sera and at the same time has reacted well with Flexner's serum This method also saves much time and material We are of opinion that morphologically and tinctorially meningococci can only be absolutely identified as meningococci by agglutination with specific meningococcic serum the appearance of the colonies on the plate with sugar reactions as stated above are far too comprehensive The method recently employed without using sugars has also the advantage that the result can be returned on the fourth or at latest on the fifth day whereas if sugars are employed it is frequently six or seven days before the result can be registered a point of great importance when hundreds of men are dealt with every week Emulsions which agglutinate with Flexner's serum were as far as possible tested with the four Gordon types in order to determine the type of the meningococcus isolated Unfortunately we have not always had sufficient of these sera at our disposal to make the test complete and the immunization of rabbits here has only just been started

The medium which has given the most satisfactory results for the plates employed by us consists of trypsin legumin agar to which 5 per cent of laked ox blood is added just before the plates are poured out The laked blood is prepared by the method suggested by Wilson (*British Medical Journal* December 30 1916) The medium combines the advantages of transparency with a sufficiency of haemoglobin The colonies are translucent and slightly [illegible] and somewhat milky by reflected light and are easily [illegible] It is interesting to note that in a small proportion of [illegible] discrete colonies of the meningococci are alone present

Preservation of Living Cultures of Meningococci

We have tested different media recommended by several workers [illegible] to determine the best medium for preserving living cultures of meningococci The medium which we have found most satisfactory is trypsin wheat germ agar used in stab cultures If this is used and care be taken to prevent evaporation cultures of meningococci will live for six weeks without subculturing The wheat germ has been obtained from the Hovis Co Ltd and the medium is made according to Gordon's formula Egg medium is also good cultures living for a month but with solidified blood

media we have not [illegible] from the pharynx in our experience do not [illegible] tending after subcultures to die out, although they have been tried on [illegible] media

PREPARATION OF A SPECIFIC AGGLUTINATION SERUM

The great demand for the specific agglutination sera prepared from Gordon's types at the central laboratory indicated it [illegible] to immunize rabbits at Greenwich to supply as far as possible the sera for Naval requirements We are [illegible] indebted to Colonel Gordon for the quantities he has already so kindly placed at our disposal and which have been of the greatest value in the previous work done We have very largely used the experience gained by Major T G M Hine in immunizing rabbits, but have made some modifications, generally taking longer in raising the serum to the necessary high titre So far only one rabbit has died during the process of immunization The cultures were those supplied by Colonel Gordon so that the results obtained should be strictly comparable We have found as he has done the greatest difficulty in obtaining a satisfactory immunization with type I and also that the titre of agglutination was at times very unstable In the [illegible] that the serum after a time sometimes gave no agglutination in low dilutions of 1 in 20 or 1 in 50, or even in 1 in 100, yet acted perfectly in higher dilutions, 1 in 200 to 1 in 1000 This we at first attributed to the use of formalin as a preservative agent but as the result was not found in all strains so treated it is impossible to put such anomalous results down to the formalin alone we think that rather it should be compared to the paradoxical reactions so often experienced with the *Micrococcus melitensis* another Gram negative coccus It is noteworthy that this characteristic is not found with any of the typho colon group of bacilli[1] We have also found that type 4 has a marked tendency to agglutinate the type 3 coccus

OBSERVATIONS ON CASES OF CEREBRO SPINAL FEVER

With regard to the cases themselves three types must be recognized (1) The fulminating form when death occurs in forty eight hours or less In these the cerebro spinal fluid when drawn off, though undoubtedly under increased pressure generally shows no polymorphonuclear increase and no meningococci At the post mortems intense signs of toxic infection are found with diffuse [illegible]

[1] Since this paper was set up Fildes has shown that 40 out of 800 tests gave anomalous reactions using Dryer's technique

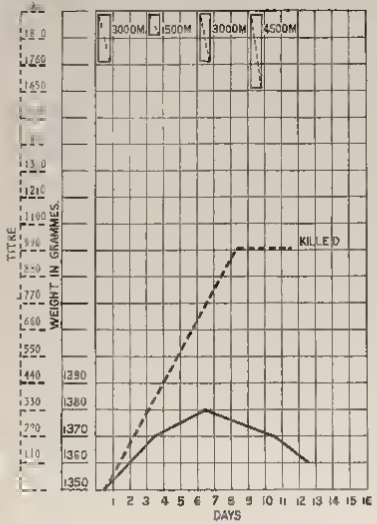


Chart 2.

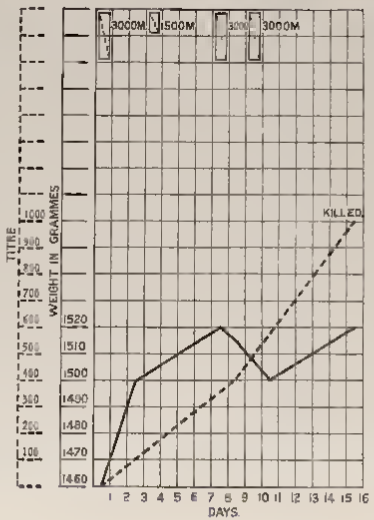
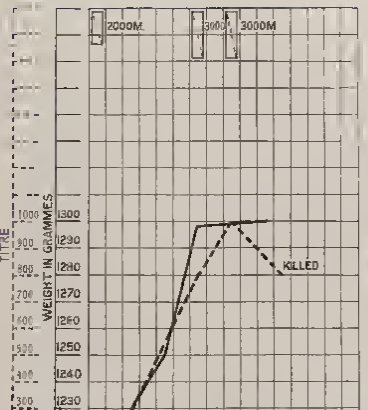


Chart 3

Gordon 2
Rabbit 7


2000M
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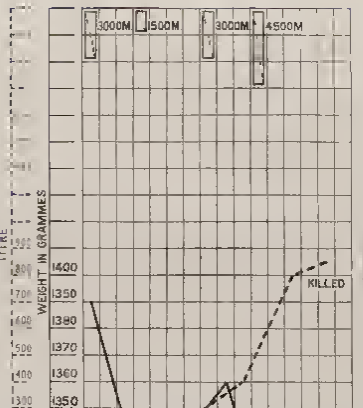
DAYS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DAYS

[illegible] into most [illegible] pus or lymph [illegible] the meninges [illegible] which may demonstrate meningococci at the [illegible] the brain (2) the ordinary acute case with abundant evidence of pus and meningococci in the cerebro-spinal fluid (3) that indefinite group with symptoms of meningismus, but no evidence of pus or meningococci even after repeated examinations of the cerebro-spinal fluid In a number of these cases when the blood has been examined by one of us (B-S) no evidence of antibody formation was obtained when the serum was tested with the four Gordon strains of cocci It is however probable that the agglutinable antibody production in the blood of man is very imperfect as may be judged by the fact that in the agglutination test for the serum of one case used as a control and in whose cerebro spinal fluid at the time abundant meningococci were present the titre did not rise above 1 in 40, hence this method of diagnosis cannot be considered a reliable one

These chronic cases in which no positive laboratory diagnosis can be made practically all recover and are not recognized as true instances of cerebro-spinal fever or tabulated as such in the Naval returns It is interesting to note that the cerebro-spinal fluid of two suspicious clinical cases when injected into guinea-pigs at Greenwich gave rise in these animals to generalized tubercular [illegible]

It should be noted that in none of our cases has a carrier been [illegible] the disease though capable of infecting others with this [illegible] latent infection, but that of seven recovered cerebro spinal fever cases three have shown meningococci in their naso pharynx the organism having been recovered five times in thirty one examinations

Finally we are strongly of the opinion (1) That it is of the [illegible] importance, as suggested by Colonel Gordon to make every [illegible] in during the "off season in the summer months to [illegible] and eliminate or cure all chronic carriers who may be present in the depots, before the commencement of the next winter [illegible] so that by a strict examination of all new entries the [illegible] at all infective centres will be kept well under control [illegible] that the importance of very thorough ventilation of all dwelling [illegible] ventilation should be recognized as a preventive measure as this has had such happy results this year at the Royal Marine Barracks, Deal where not a single case has occurred though the disease was prevalent in the town itself

OBSERVATIONS ON THE DIAGNOSIS OF ACUTE APPENDICULAR DISEASE

By Acting Staff Surgeon D. P. D. Wilkie, M.[illegible], R.N.V.R.

R.N. Hospital Ship St. Margaret of Scotland

It is now agreed that when a diagnosis of [illegible] appendix has been made in any given case [illegible] it be feasible is the wisest line of treatment. The [illegible] problem at the present day is the diagnosis of the [illegible] early stages when operative treatment prevents [illegible] One of the chief difficulties connected with diagnosis lies in the fact that during the first twelve to twenty four hours different forms of genuine acute disease of the appendix may and frequently do present widely different clinical pictures. These cases are [illegible] rule all classed together as "appendicitis" and consequently a description of the symptomatology of this disease must be qualified by reservations which do anything but tend to make for a precise and confident diagnosis. Thus in one case in which for the first twelve hours from the onset of pain there was no appreciable [illegible] of pulse or temperature, there is revealed at operation, some hours later, a gangrenous appendix; whilst in another case which [illegible] constitutional symptoms were from the outset more pronounced, there is found after the same interval merely a slightly swollen and inflamed organ.

This difficulty in diagnosis is due mainly to the fact that under the term "appendicitis" it has been customary to include two pathological entities—the one acute inflammation of the appendix, the other, acute obstruction of the appendix. By recognising these two diseases which are fundamentally different and which in their early stages present their own characteristic clinical picture, the symptomatology of acute appendicular disease is placed on a much clearer and more rational basis and early diagnosis is simplified.

Pathology

(1) *Acute Appendicitis.*—The appendix having much lymphoid tissue in its wall is liable to be the seat of inflammation. This may be of a catarrhal nature associated with a similar condition in the caecum; frequently however the earliest and most advanced

[illegible] sub epithelial lymph[illegible] [illegible] unfiltration of the wall [illegible] appendix [illegible] and general symptoms such as a rise of temperature and of pulse rate, are almost invariable Ulceration and softening of the wall may lead to perforation in such cases but this is not the rule, and frequently the condition subsides without surgical treatment Occasionally however from swelling of the mucosa near the proximal end of the organ or at some slight constriction the result of a previous attack of inflammation and possibly aided by the impaction of concretion at the narrow part, a secondary obstruction of the appendix occurs The case now assumes a much more serious aspect a purulent accumulation forms behind the obstruction distending the appendix and tending to gangrene and perforation

When *spasms* of severe pain supervene in a case in which, to begin with, only a dull and constant pain was present, this complicating obstructive factor must be suspected and operation should on no account be delayed

(2) *Acute Obstruction of the Appendix*—This condition I consider to be a pathological and clinical entity, the recognition of which is of great importance because it is associated with a high mortality unless prompt diagnosis is made and early operation undertaken

The appendix being a hollow viscus is liable to obstruction of its lumen as is any other portion of the alimentary canal The question as to what will happen if the lumen of the appendix becomes completely blocked near its outlet into the caecum is one which can only be decided by experiment It has been shown[1] that, if the last loop of the ileum (of, e g, the cat) be isolated and its ends closed without interfering with its blood supply its behaviour will depend exactly on what its content happens to be when isolated If the loop was empty of faecal content it will (in the majority of cases) slowly fill up with mucus and form a sausage shaped cyst in the abdomen If however, the loop contained faecal matter the sequel is very different Blood is poured out into the loop which rapidly becomes distended, and either the epithelium of the loop is shed off along with many leucocytes into the lumen, giving rise to an empyema of the loop which eventually bursts, or rapid gangrene of the walls of the loop ensues with a surrounding peritonitis the animal frequently dying before rupture

[illegible] the same pathological conditions [illegible] in the [illegible] appendix. A mucocele of the appendix is not a rare condition gives rise to little trouble and is usually discovered either post-mortem or at an operation for some other abdominal condition. An empyema of the appendix is also a well recognized pathological condition whilst an ulcerated totally green and gangrenous appendix either tense and distended with fæculo purulent content or perforated and collapsed is a familiar finding to all surgeons.

Mechanism of Obstruction.—Aschoff[1] and others have shown that the majority of appendices examined post-mortem show fibrous narrowings and submucous cicatrices the legacy of former probably unrecognized attacks of mild appendicitis. Many appendices contain distal to such a slight narrowing an oblong fæcal concretion which can be readily moved along the lumen except at the stenosed area where it is usually arrested.

If a healthy young man having an appendix such as that just described should in straining force some fæcal matter from the cæcum into the appendix beyond the narrowed area what will be the sequence of events? The appendix carrying out as it does rhythmic peristaltic contractions will tend to empty itself of the fæcal matter. Occasionally however instead of emptying itself it may drive the hard concretion into the stenosed area where it impacts. We have now all the elements necessary for trouble—viz. a closed appendix containing fæcal matter. Fluid is poured out the appendix takes on spasms of violent contraction and as the tension gets more and more pronounced the walls partly from tension and partly from toxic action of the content undergo degenerative changes spots of gangrene appear, and if left to itself perforation occurs. (Clinically perforation is often associated with sudden relief from the violent spasmodic pains.)

That mere blockage of the lumen of an appendix containing some fæcal matter can lead, sometimes within a few hours, to gangrene of its wall is a fact difficult to appreciate but after repeated experimental proof that such profound and rapid changes do occur, one is impressed with the primary importance of this fact. Thus is explained that deceptive yet fulminant type of case which figures so largely in the death roll of "appendicitis." It is not appendicitis, i.e., an inflammation of the appendix but it is acute

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[1] Aschoff. *Die Wurmfortsatzentzündung.* Jena. 1908.

appendicular obstruction [illegible] more serious condition, calling for immediate operation [illegible] *conditions*

Clinical features of Acute Appendicular Obstruction—As distinguished from appendicitis the onset in this condition is more sudden gripping pain coming on in spasms associated usually with vomiting and with a definite localised tenderness in the right iliac or lumbar regions of the abdomen The pulse-rate may rise but *the temperature often remains normal until a comparatively late* [illegible] and, therefore gives no help in diagnosis

The facies of the patient almost always expresses anxiety—an important diagnostic feature Spasmodic pain, local tenderness and rigidity and the patient's facies are the three things on which I make the diagnosis

The following notes of two cases illustrate the above mentioned points —

[illegible] 1—C B aged 17 boy, was bathing from the side of his ship a [illegible] Shortly after coming out of the water he was suddenly seized [illegible] violent abdominal pain He felt very sick but did not vomit The pain recurred at short intervals and at 7 30 p m he reported at the sick [illegible] His temperature was 99° F pulse 108, there was some tenderness [illegible] the appendix region but no rigidity The spasmodic pain continued [illegible] he vomited twice At 11 30 p m the tenderness was more marked [illegible] there was some rigidity His temperature was 99° F pulse 110 [illegible] was removed to the hospital ship taken straight to the theatre and [illegible] on six hours after the onset of the attack A long appendix [illegible] in its proximal third but greatly distended and showing areas of commencing gangrene in its distal two thirds, was removed and the abdomen closed without drainage Examination of the appendix showed that its distal portion contained fluid fecal matter and exudate under great tension At the junction of the proximal and middle thirds there was a constriction of the lumen in which a concretion had become impacted causing complete obstruction

In this case owing to the great tension in the appendix very rapid changes were taking place in its wall so rapid that *within six hours of the onset* areas of gangrene were visible Prompt recognition of the condition, however, made what if left longer would have been a very serious case a very easy one to deal with

Case 2—M T aged 23, stoker On the evening of November 21 he was seized with pain over the abdomen chiefly on the right side The pain continued intermittently through the night and he reported sick on the morning of November 22 He was found to have some tenderness and rigidity on the right side of the abdomen *His temperature was normal his pulse* 48 Kept under observation during the day his pains continued and in the evening his temperature rose, being at midnight 102° F, pulse rate 96 He was given morphia ½ gr, at 1 a m On the morning of

November [illegible] abdominal ten[illegible] rigid [illegible] general. He was in [illegible] hospital ship.

On admission he [illegible] pinched and very ill. His pulse [illegible] was 105, temperature [illegible]. The abdomen was rigid and tender all over.

At operation free [illegible] pus was found. A much enlarged appendix, which had [illegible] through a gangrenous area just distal to a constriction could be [illegible] removed. Films from the peritoneal exudate showed numerous [illegible] bacteria but active phagocytosis, so that a favourable prognosis could be given. The patient was very ill for two days after operation but [illegible] a good recovery.

In this case twelve hours after the onset of the attack the pulse and temperature were [illegible] and, therefore, in spite of the local signs he was kept under observation until the symptoms of inflammation (here peritonitis) [illegible] by which time he had entered a critical stage.

These two cases [illegible] to show the importance of recognizing the clinical entity "acute appendicular obstruction" and the imperative necessity for early operation in this class of case. When an appendix case turns up in a warship at sea (more than twenty-four hours from port) and the conditions are unfavourable for operating the question will always arise as to whether it is wiser to operate at once under very adverse conditions or to wait until the patient can be taken to a hospital or hospital ship. In such a case, if the disease is of the obstructive type, the patient looking distressed and ill and having spasmodic pain accompanied by local tenderness, it is much wiser to operate at once no matter how adverse the conditions or inexperienced the operator. These cases in their early stages are easy to deal with, the appendix being tense, easily found and free of adhesions. When the case is one of simple inflammation of the appendix with a rise of temperature and with more constant and less acute pain, the risks of waiting are not nearly so great and the obligation to operate at once is no means imperative.

Pseudo-Appendicitis

The differential diagnosis of acute abdominal conditions is undoubtedly much more difficult in regions where various forms of enteritis and colitis (paratyphoid, dysentery, &c.) are prevalent, and not infrequently a clinical picture is presented which at home would confidently be labelled appendicitis, but which when met with in a warm climate calls for a stricter investigation.

Cases presenting pain on the right side of the abdomen with

[illegible] in the right iliac region associated with [illegible] and temperature certainly suggest a diagnosis of appendicitis nevertheless only a small proportion of such cases admitted to a hospital ship in the Eastern Mediterranean turn out to be genuine appendicitis After having proved on the operating table on several occasions one s mistaken diagnosis of appendicitis the following points have been found helpful in coming to a diagnosis in this type of case to which the clinical term 'pseudo appendicitis' may be applied

(1) In such cases there is never *true rigidity* of the right rectus muscle, i e, although on one examination rigidity may be made out, a second examination will probably fail to find it When this evanescent and spurious rigidity is encountered doubt as to the diagnosis of appendicitis should immediately arise

(2) Such patients *do not present the abdominal facies* but are usually flushed

(3) A *leucocyte count* often gives help as the type of appendicitis case which such cases simulate is nearly always associated with some degree of leucocytosis These cases have none

(4) A *small enema of warm water* will sometimes bring away a little mucus and blood, even though there is no history of the patient having previously passed any

The following short notes of a typical case illustrate those points —

Case 3 —A B , aged 38, was admitted as a case of acute appendicitis for operation He gave a history of pain in the right side of the abdomen for two days with very definite tenderness in the right iliac region temperature 100° F pulse 80 He had been constipated for six days before admission previous to that he had had diarrhœa for two days On examination he was seen to be flushed but did not look very ill There was very marked tenderness in the right iliac region and some rigidity the latter, however was not consistently present on further examination

A leucocyte count gave 7 500 per cubic millimetre A small enema was given and this brought away a little mucus and blood The case was therefore not one for operation On the following day the tenderness was less and the rigidity had gone altogether rapid recovery took place

In these cases, as we have seen at operation, there is a typhlitis and the appendix if involved at all is usually less congested than is the cæcum

SPHAGNUM MOSS ITS PECULIARITIES AND USES AS A SURGICAL DRESSING

By Lieut [illegible] Surgeon [illegible] R N

The so called Sphagnum Moss [illegible] class *Musci*—sub class *Sphagnales*—order [illegible] The last order has only one genus, *Sphagnum* and [illegible] as there are many species, more or less according to the [illegible] Mr H N Dixon divides the genus into some twelve species whilst in a study of our Sphagna in the *Journal of Botany* by Mr E C Horrell—"The European Sphagnaceæ (after Warnstorf)"—the number of British species is raised to forty

The Sphagnaceæ differ widely from the rest of the mosses and by some authorities they are not considered to be mosses in the strictest sense of the word Dixon says that in the fasciculate arrangement of the branches in the cell structure of the leaves and in the absence except in the young state of rootlets their vegetable morphology has no parallel among the mosses, while the structure of the reproductive organs, both male and female serves still further to widen the gap

The stem of the various species of sphagnum is usually erect and thread-like the erect position being only maintained by the crowded condition of the plants It is composed of two forms of tissue a central cylinder or axis usually coloured and having the outer layers of its cells tough and hard this is surrounded by a cuticular sheath of layers of large hyaline cells with thin walls The cuticular sheath of the branches usually has in addition an outer series of flask shaped cells, the retort cells, slightly narrowed above into a neck which is frequently more or less recurved from the branch The stem leaves are thin and fragile differing in form and structure from those of the branches The branches are in fascicles of three to twelve generally of two forms some being pendant and appressed to the stem usually longer and more flagelliform than the others which are divergent more spreading or even ascending and for the most part stouter with shorter and broader leaves The branches at the apex of the stem are as a rule more densely crowded and shorter, forming a more or less compact head the capitulum The antheridia are stalked globular and lie singly in the axils of the bracts usually at the apex of specialized branches of the capitulum

A short botanical description of sphagnum is as follows A

genus of mosses, whose spore case is an urn closed by a de[illegible] lid, and its brim toothless the calyptra irregularly torn

The two best known of the native species of the genus are (1) *Sphagnum cuspidatum* with bright green pointed leaves—sometimes the leaves are greenish white it is usually more [illegible] aquatic and submerged, stem pale green or brown cuticular cells all two layers distinct not porose, height 6 to 18 in (2) *Sphagnum cymbifolium* pale greenish white frequently with a tint [illegible] simple cuticular cells of stem in three to five layers fibrous and porose stem leaves broadly lingulate—spatulate—broadly round [illegible] summit

The latter is the best kind for surgical purposes, although the other is quite good Both kinds have a button-like crown of leaves at the top except when the plant is sprouting The crowns are tufted and massed together, and are known as 'sphagnum cushions' The moss is common in bogs hence its name Bog Moss

The colour of the various species of sphagnum varies from white through all shades of pink and reddish brown to a rich deep red and through every tint of green and greenish-yellow to a bright grass green In shady situations green is the prevailing tint in the open the red tint frequently preponderates, owing to the formation of tannin (Dixon)

The sphagna absorb water like a sponge, but become friable when dry They contribute much to the formation of peat The following particulars regarding sphagnum moss are taken from an article contributed to the *Scotsman* on November 17 1911 by Professor L Bayley Balfour and Lieutenant Colonel Charles Cathcart F R C S

'Bog Moss or Sphagnum is the only moss which in nature has a far-reaching influence upon the surface of the earth as a soil-forming agent and it is the only moss which has proved itself as yet to be of economic value to civilized nations Its formative influence and its economic value respectively depend upon the peculiar construction of the plant Its smooth stem is densely beset with leaves and emits a branch at every fourth leaf At the periphery of the stem are one or more layers of fine colourless chambers, known as capillary cells, whose thin walls have big perforations and are strengthened against collapse by a thickening band running spirally or in rings around the inside The leaf is formed of a single layer of chambers or cells Some of them, narrow and green form a network of feeding cells, in the meshes of which are longer broader, colourless cells, perforated and thickened after the fashion

[illegible] very fine sponge. The perforated cell [illegible] and hold it firmly. The water can be squeezed out if then [illegible] do not collapse, and are ready to take up water again. In [illegible] plant takes all its water from the atmosphere. It is independent on soil water, and from top to bottom [illegible] with the water retained in its delicate chambers. By [illegible] the plant forms compact cushions. These have [illegible] and as the older parts die off below and [illegible] into the [illegible] peat, the tops constantly and vigorously [illegible] long as the precipitation of moisture from the atmosphere [illegible]. While the older cushions are thus growing [illegible] formed by lateral extension and thus [illegible] as High Moor.

Lieutenant-Colonel Charles Cathcart in the *[illegible] Journal* July 21 1915 gives some further interesting particulars regarding sphagnum. He says: "Horticulturists have [illegible] use of it as an agent for holding moisture in pots and plant [illegible] orchids. It has also been largely used as a substitute for [illegible] straw on account of its great absorbing power, and it has [illegible] used as a substitute for cotton wool in the dressing of wounds. For this purpose its resilient perforated cells fit it admirably. We owe the introduction of sphagnum moss as a surgical [illegible] Germany, where it has been established for this purpose for [illegible] years. Its use as a dressing was found out by accident. A wounded man severely lacerated his arm and having no other [illegible] bandages, dressed his wound with bog moss. When the [illegible] removed after an interval of several days the wounds were [illegible] have healed. An investigation was made from a [illegible] and bacteriological point of view. The practical outcome of the inquiry was that the value of sphagnum moss as a surgical dressing was found to be due to its marvellous power of absorbing fluid. The growing plant collected and dried has this power at its maximum but the light brown layers of semi decayed moss which lie above the peat proper retain great absorptive powers and constitute the valuable material known as moss litter. Various articles were published in German surgical journals by Neuber and others and it is now used in some of the largest German hospitals and in private practice. After a thirty years trial the Germans still have a favourable opinion of sphagnum moss or moss.

It is an interesting fact that the heather beetle lays its clutches

[illegible] indirectly the [illegible] time should select the [illegible] on their [illegible] owing to its perennial dampness it is [illegible] impossible to destroy sphagnum by burning

It is chiefly due to Lieutenant Colonel C. W. Cattcart, of Edinburgh, that this excellent surgical dressing has been brought to the notice of the profession in this country

[illegible] moss [illegible] Sphagnum [illegible] Replicon [illegible]

[illegible] of the Moss.—As the moss holds so much water [illegible] with which it is [illegible] permeated, it should be [illegible] as possible as soon as it is collected This may be [illegible] hands or by means [illegible] improvised wringer made [illegible] and a stump [illegible] the latter is the method [illegible]

[illegible] collected the moss [illegible] and carried it home [illegible] this is best [illegible] but it is still damp [illegible] table or large wooden tray and cleared of

[illegible] leaves and other foreign matter [illegible] now dried in the fresh air or by artificial heat. [illegible] preferable, because it leaves the moss elastic while [illegible] apt to overheat it, and render it friable and easily [illegible] dust. On board ship I dried the moss by leaving [illegible] ment with the electric light kept burning. It [illegible] place the moss on a fine meshed net (old fishing [illegible]

[illegible]

[illegible] this the [illegible] Another method [illegible] the moss [illegible] put the bags to [illegible] [illegible] The moss is enclosed in butt [illegible] bags [illegible] The machine should have [illegible] by 60 [illegible] consists about 36 [illegible] The bags [illegible] sizes. First size [illegible] by [illegible] second size 10 [illegible] by [illegible] One [illegible] thirty of first size [illegible] second size [illegible] size out of [illegible] bags in all. [illegible] sphagnum [illegible]

p[illegible] plant [illegible] In [illegible] be placed [illegible] tightly [illegible] sphagnum can [illegible] pillows for the sick, and [illegible] springiness renders [illegible] for this purpose.

The moss besides [illegible] and soft, has a springiness [illegible] in cotton [illegible] the power of not only absorbing [illegible] but of diffusing [illegible] throughout the whole pad, while [illegible] absorbs [illegible] passes the discharges straight [illegible] the bedcloth[illegible] In the case of fetid discharges [illegible] These properties [illegible] of great importance in the [illegible] I found by exper[illegible] its own weight of water [illegible] simple dressing like [illegible]

[illegible] of the bags of moss I have used [illegible] ships [illegible] the bags of moss in the [illegible] left [illegible]

[illegible] I have tried several [illegible] Lieutenant Colonel [illegible] described [illegible] April 1[illegible] 1916 [illegible] better than [illegible] method is simple, needs little apparatus and is easily [illegible]

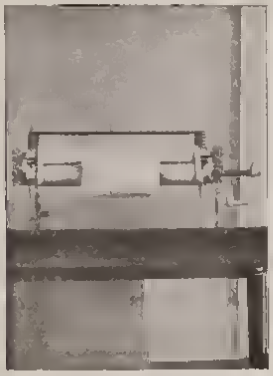
[illegible] by Corrosive [illegible] [illegible] object is to charge the moss [illegible] percentage [illegible] sublimate.

The proportion adopted [illegible] that commonly added to [illegible] namely 0·2[illegible] of sublimated [illegible] would contain ½ lb [illegible] checking the [illegible] 1 000 [illegible] of sub[illegible] pound [illegible] convenient way of [illegible] tablets issued com[illegible] in 20 oz of [illegible] tablet contains [illegible]

[illegible] determine the strength of the solution in which to [illegible] point to [illegible] out of the [illegible] The exact quantity [illegible] so long [illegible] adhered [illegible] When using the [illegible] described below it will [illegible] screen [illegible] 16 oz of dry

[illegible] will weigh 30 oz after having been [illegible] Very experiments with water should be tried [illegible] many threads of the screw have to be [illegible] in order to produce this result When this [illegible] pression has been attained this will be the pressure required towards [illegible] ibre of gallons of solution can be made by adding at the rate of two tablets to each imperial pint of water This [illegible] 100 [illegible] is a very powerful antiseptic

The wringer is a small one [illegible] as the [illegible] with rubber [illegible] roller 16 in broad but this small wringer may be used [illegible] I have used the "Champion



[illegible]

Having dried the [illegible] the [illegible] the [illegible] the [illegible] [illegible] will attach [illegible] wooden tubes [illegible] On the upright face of the tube [illegible] the wringer [illegible]

A small shelf [illegible] of the wringer [illegible] the tub, and [illegible] guide the [illegible] the bags back [illegible] the tub On the other side of the [illegible] shelf is attached sloping away from the tub [illegible] the moss bags (as they leave the wringer) into the basket placed for their reception Between the two halves a short vertical partition should rise up to prevent the solution from wetting the moss bags which have passed through the wringer The sublimating can be done by one person—but [illegible] two

The bags are thoroughly soaked in the solution for a few minutes then gently squeezed with the hands and passed through the wringer Rubber gloves are necessary to protect the hands After careful drying the bags may be further compressed by passing them through the wringer the bags must be thoroughly dry in order to be compressed—a damp bag is elastic, and springs out again The rollers of the wringer must be dry before being used for the compression of the bags The maximum pressure having been produced by the tightening screw of the wringer each bag is passed through twice—once in its ordinary shape and once folded upon itself

The bags, after having been sublimated and dried, are ready for use whether in the compressed or loose form They must on no account be sterilized by steam When being packed for sterilizing or transit, they should be enclosed in flannelette bags (previously sterilized) or in waterproof cloth All moss dressings being very absorbent, should be protected from moisture but this is specially true of compressed moss

Instead of ordinary picric acid (lint) dressings one can use bags of moss impregnated with picric acid solution and dried These can be wetted and applied to burns or bags of sterilized moss can be soaked in a solution of picric acid at the time of dressing and then applied They do not dry as quickly as the picric acid lint, and this is an advantage moreover discharges from the damaged surface are quickly absorbed I have also tried medication of the moss with malachite green and sublimate and also with chloramine, the latter is expensive at present if used on a large scale

I understand that sphagnum moss has long been placed on the list of materials for surgical dressings approved by the War Office, and many large orders have been supplied by the depots where the dressings are prepared notably the Scottish War Dressings Supply Organization In Ireland large quantities of the moss have been collected and made into dressings under the supervision of the

[illegible] Ambulance [illegible] country. Hospitals [illegible] Egypt [illegible]

[illegible] the [illegible] than [illegible] surplus [illegible] action [illegible] the [illegible] of the [illegible] will be [illegible] much dressing material provided. It can [illegible] and these moss dressings [illegible] if compressed [illegible] and do not take much [illegible] The [illegible] and patients dressed with [illegible]

Its [illegible] already referred to [illegible] point [illegible] the moss is somewhat hardened and [illegible] power [illegible] some extent inhibited [illegible] the application [illegible] softens the tubules and absorption readily takes place. [illegible] best plan to insure the full absorptive power of the [illegible] the bag of [illegible] moss [illegible] antiseptic [illegible] wring it out just before applying to the wound.

It is reported [illegible] that sterilized pads of sphagnum moss even [illegible] proved to be a better absorbent dressing [illegible] double advantage [illegible] wetting the [illegible] (1) One [illegible] with the risk [illegible] getting [illegible] wound and (2) the absorptive power of the moss [illegible]

Lieutenant-Colonel C. W. Cathcart [illegible] These [illegible] wounds [illegible] freely. In such [illegible] best results will be obtained [illegible] moss is applied [illegible] gauze is [illegible] antiseptic [illegible] the wound [illegible] overlapping [illegible] bags of moss [illegible] as required. After [illegible] out of the [illegible] lotion, the contained moss is lightly [illegible] with the fingers; this is done easily owing to the elasticity of the material [illegible] the bags are held comfortably in position with a bandage.

To carry out the making of these dressings on a large [illegible] one should follow the detailed instructions given by Lieutenant-Colonel Cathcart in his various articles on the subject of sphagnum moss dressings. In these notes I have simply collected together a few points regarding sphagnum moss which may be of interest and have shown how, on a small scale, one can very easily add to one's store of useful dressings for the wounded.

SOME OBSERVATIONS ON CADETS' TRAINING

[illegible] EVAN PICKARD

[illegible] infectious diseases at Osborne [illegible] letters in the press. Unfortu[illegible] in my possession but from certain [illegible] been others. The immediate object [illegible] is not [illegible] these letters in detail. Some of the [illegible] contained in [illegible] have no knowledge of and if I had [illegible] be suitable [illegible] in this Journal. One or two points [illegible] duly tomb[illegible]

[illegible] the [illegible] is for women to look after [illegible] — they [illegible] fifth all —I quote from one letter [illegible] — "Women are as quick to note what [illegible] Men [illegible] notice. I must take exception [illegible] schools in England where there [illegible] people gath[illegible] whose duties are extremely [illegible] whose united [illegible] physical and mental welfare of [illegible] is there use at O[illegible] and Dartmouth. I do not wish [illegible] the uses of women in dealing often boys in the very [illegible] Osborne has its Matron as any other school together [illegible] at Nursing Sisters. But I doubt very much from the [illegible] the work and the [illegible] which it is carried on whether [illegible] for w[illegible] [illegible] than they are now [illegible] subject that I [illegible] on is that of the deaths at [illegible] in recent publi[illegible] One corresp[illegible] writes to say [illegible] fifth (or 4th) has just been reported and goes on to say that [illegible] unequalled. I [illegible] in any public school [illegible] and [illegible] action. [illegible] credibly informed that during the [illegible] of this year there were seventeen deaths in one very [illegible] school where the numbers would be about the same as [illegible] but when the ages of the boys would be from 14 to 18 [illegible] much higher age at Osborne.

[illegible] my own experience of an epidemic at one of the colleges we [illegible] deaths. One of these from bronchi-pneumonia and the [illegible] from that extremely rare complication—meningitis. Both [illegible] unfortunate events were duly reported in the press and in [illegible] prominent fashion. Yet on the same page as one of the [illegible] I found tucked away in a corner a small paragraph relating [illegible] of five deaths in one week at quite a small school. One

really shoulders to think of what would have been [illegible] unfortunate establishment been Osborne or Dartmouth.

I only make these few prefatory remarks to try and [illegible] false impressions, and likewise as a small act [illegible] few old sailors. (I quote again.)

Now for the main object of this paper. One [illegible] makes a very definite statement which is quite [illegible] I quote in full. "The boys are certainly [illegible] physical and mental strain is far too severe [illegible] their age. None but the most robust can go through [illegible] This is no new thought or statement. Anyone who [illegible] of experience at the Cadets' Training [illegible] himself the question—As [illegible] identical statement made to him in [illegible] two [illegible] first my natural impulse was for reasons. [illegible] was much as follows: "For the first two or three [illegible] have the boys [illegible] disinclined to do anything. [illegible] about and [illegible] [illegible]

Now the probable reason of that [illegible] natural and an intensely human one. All of us [illegible] strict and [illegible] know the [illegible] and having all [illegible] what [illegible] respect the subject [illegible] different [illegible] Change of climate which [illegible] for the place where he is to spend his [illegible] [illegible] sickness which [illegible] acclimatized. [illegible] to be [illegible]

But supposing this [illegible] then it will be necessary [illegible] Perhaps I may [illegible] [illegible] symptom.

Anoth[illegible] discussion [illegible] that [illegible] highly important [illegible] place in the boy at [illegible] this paper but should never be lost sight of especially in [illegible] tion with the boy being overdriven It his slackness is d[illegible] onset of puberty the fact can be established and appropriate measures taken and I would, under those conditions allow [illegible] rest as much as he pleased while on leave so as to store up [illegible]

That leaves us with the last cause—that he is being overworked The charge is made and I have never heard any real proof in support There may be most excellent evidence that he is overworked I ask myself this question Can I prove that he is not overworked Can I produce any evidence which makes it likely he is not tried too highly ? It is of course quite impossible for me to discuss the purely educational side I am totally ignorant of some of the subjects taught I do not know what the required standard may be, nor do I know what percentage attain or fail to attain that standard It would be easier for me to describe and discuss the physical side of the question but as I am about to try and point out we want to get at the results and if those results are bad then the time has come to alter the methods and if possible to improve them I do not mean to say that if the results are good no more need be said far from it Methods are often capable of improvement and thus is progress made

How then can I put forward my ideas on the cadets training or rather its results ? My pen is certainly not ready enough to draw a true picture of college life in all its varied aspects I very much doubt if anyone could I have read descriptions of college life—delightful to read but totally inadequate for our purpose

A brief visit is of no account I have shown many people round one of these colleges and they have asked many questions Possibly my methods of conveying information were bad because it so often happened that they carried away some quite small detail which was all they learned I may be pardoned perhaps if I relate a story of a lady friend of mine who was so interested in education and would I show her the college She fixed on a copy of the time table in one of the gunrooms and was amazed to find that cadets did not learn Latin After an exhaustive and to me exhausting survey she went away with that one soul shaking discovery and nothing else I rather suspect that some correspon

[illegible] the press are rather [illegible] [illegible] a short visit A brief visit or conversation is not sufficient to find such definite statements as are sometimes made

If we want to get to the bottom of this matter I think it is no use to describe or discuss existing conditions, but we must judge by results By the term existing conditions I mean being able to point to a certain percentage of boys and saying These boys have been ruined mentally and physically by the method of training and as they cannot become efficient naval officers so they must be invalided Frankly I do not believe such exists at any rate I have never seen or heard of one That cadets have to be invalided there is no denying In my own knowledge invalidings have been for such diseases as increasing myopia mental disease and the like but never for complete breakdown In discussing existing conditions, it would be necessary to have figures relating to total new entries percentage of invalidings and losses from all causes and these I have not got nor am I approaching the subject from this direction

And what results can we point to?

I was once discussing the question with a medical officer who said that the true results would be apparent when these young officers reached the age of 40 or 45 He rather took the view that at that time they would be played out I suppose the first cadets trained under the new scheme are now somewhere about the age of 26 This does not leave many years before he can be proved right or wrong If he is right, or my likelihood of him being so then the matter is extremely urgent We cannot afford to wait for this way of proving the matter and must find other means

It would be interesting to know the incidence of certain diseases—neurasthenia for instance—during the War and occurring in the junior executive officer up to four or five years seniority During the War my lot has been cast in appointments where large numbers of these young officers were assembled—chiefly in destroyers and submarines If there had been much of this disease I should most likely have come across it As it is I have only seen one case of neurasthenia in this type of officer Does this look as if Osborne and Dartmouth were producing mental and physical wrecks? Many of these same officers I knew as cadets and their present state of mind and body does not cause me any alarm Admirals in their despatches have paid tribute to the endurance and resource of these young officers, and it should be remembered that only a few months before some of them had been

children at Osborne. Another method would be an examination of the standard of ability of these officers at the present day. Obviously this is not a question that can be discussed in a medical journal, even if it were possible for me to do it.

All these are possible ways of getting at the truth and it only remains for me to produce some evidence in favour of the training methods now in force.

It will be remembered that the charge is levelled against Osborne. Now I know practically nothing of Osborne. Many of the letter writers appear to know much. At first sight it might appear worse than ridiculous that I should take up the cudgels on behalf of Osborne when I confess that I have never experienced the life there. My own experience of cadets training extends over the two and a half years after they have left Osborne and therein lies an extension of my point that we ought to judge by results and not by existing circumstances. My evidence is founded on the physical measurements which are regularly taken. I think it may be useful to make some remarks on these measurements.

I used to think that one or another of these dimensions taken singly might lead to some conclusion. But on further reading and thinking I am led to believe that that view is quite wrong. I used to think that weight was far and away the most important. It is only natural when one considers that the loss of weight is so constant a sign in a large number of diseases both mental and physical. The other two dimensions are not going to be altered much by disease except in the well known cases of rapid growth in height after prolonged confinement in bed and in lessened thorax capacity in diseases of the chest. These dimensions must be studied in their relation to one another. I may mention here that these three measurements of height, weight and chest expansion are enough, with the possible exception of an estimation of lung capacity. The text-books dealing with the subject give such details as the rate of increase in the measurement from the axilla to the crest of the ilium and so on. But those measurements which we take should be accurate, regular and studied in relation to age. My own recollection of measurements taken at school fills me with sorrow and regret. For instance boys were weighed with their clothes on, and a certain deduction made. Nothing could be more fallacious. A chest measurement might be taken over a shirt. Any one who has ever measured a chest knows the numerous pitfalls there are—especially may I say so in the case of cadets who are keenly interested not I regret, in the

[illegible] whose greatest joy was in the attainment of another [illegible] the region of the upper arm. Happily Swedish [illegible] caters for the masses, has replaced to a large extent the [illegible] and parallel bars which only catered for the classes, and it [illegible] of local muscular development is, I hope gone for ever

In looking up the literature or some of it on the [illegible] these dimensions I have ached very largely in a compl[illegible] work by G Stanley Hall, entitled Adolescence [illegible] masses of figures and many authorities and it has [illegible] requiring some expenditure of time to try and extract the [illegible] we require The first thing that strikes one is a certain div[illegible] of opinion as to the value of height, weight or other measure[illegible] taken separately, as a guide to indication of physical welfare

Let us take height first Hall says "Of all single measurements height is the most valuable It is easily taken, is relatively constant and not liable to much fluctuation Along with weight it is the truest expression of the energy of growth the best index of health and gives a datum from which by the use of [illegible] norms and standards many other data can be approximately inferred This extract may be taken as representing the view of most authorities I have consulted

Next as to weight Here we find rather more diversity of opinion Hall says Weighing on the other hand gives no evidence of qualitative change Decay in the most important structures may be compensated by fat and water and weight may increase from imperfect elimination of waste Another authority Hansen, as the result of experiments in during came to the conclusion that weight is not an index of essential growth [illegible] his experiments were made on deaf mutes I think possibly they are of little value, at any rate from our point of view because there may have been other mental or physical abnormality present in his subjects At any rate they were not entirely normal boys On the other hand, Beyer in examining some apprentices concluded that "weight has a great significance in judging the physique of a young person and consequently his capacity for mental work

As regards chest measurement by itself nothing much is said It is, however, mentioned in its relation to other measurements (In discussing chest measurements it should be remembered that one ought to pay attention to the difference between the maximum

and minimum [illegible] thoracic capacity. Muscular development [illegible] have something to do with these measurements [illegible] the point we want to get at.) To put it [illegible] measurements (thoracic capacity) I've [illegible] graphs to have a definite relation to both [illegible] weight and that this is the more exact in the latter [illegible] the ratio of lung capacity to weight is called the vital index. One ought to say that the measurements taken on cadets are not true representations of lung capacity but are very excellent pointers.

The whole subject of the correlation of different measurements is so complex and so vast that it appears to me next to impossible to reduce it to reasonable limits for the purpose of this paper. That there is a relation seems to be true. Vinogensky found that there was some such relation but it could not be exactly stated. In the same connection G. S. Hall says: 'In general while growth in height is one of the most desirable expressions of vital energy, but few would deny that symmetry and proportion are of at least no less importance.'

So it is to be hoped that enough has been said to show that these three measurements must be studied in their relation to one another and so pave the way for one or two less debatable facts.

In the boy who is growing normally it would appear that there is less likelihood of him falling a victim to any disease. If a boy grows too rapidly in height his resistance is likely to become lowered. Otherwise height being a more or less constant factor there is not much to be learned here except to note in passing that complete arrest calls for a search for morbid conditions. On the other hand, it seems to be proved that resistance to disease is greater with an increase in weight. It seems almost unnecessary to mention that loss of weight is almost constant in any disease mental or physical acute or chronic. It is clear then that we may take it that continued and normal growth is a sign of mental and physical welfare and that the opposite holds good. Likewise excessive functional activity or, as in this case the alleged excessive functional activity would retard growth.

Enough has now been said to point out the line that has been taken to try and arrive at some result. I have in my possession tabulated results of the measurements of the first 1,000 cadets trained under the New Scheme: now I believe somewhere about fifteen years old. Being away from England I cannot produce them and it may be that any value which may be attached to this

[illegible] I am [illegible] note from [illegible] in my own mind as to the correct figure [illegible] given the [illegible] will not do so I refrain and will only give my results in general rather than exact terms

But first a short account of how these figures were obtained may be given The measurements taken are those of height weight, and chest in the latter case maximum and minimum expansion note being made as to the difference These are all recorded in a book together with the age in years and months (e g 14 years and 7 months) The first is taken on joining, (in this series it is just after the cadet has completed two years at Osborne) Further records are made at the end of the first term and at the end of each succeeding term In all we have seven records extending over a period of two years Against each cadet's own record is entered the normal standard at that particular age Thus at a glance one can see if he has increased the normal amount in any given period of time I ought to say that these standards are founded on the published figures of many authorities on the physique of boys of the public school class and are in no way flattering

It would have been easy to give the average measurements of these 1 000 boys and leave it at that but I do not think it would prove what we hope There might be a group of largely developed boys much above the normal and these would very materially increase the average or produce a rather fictitious result I thought the right method was to see if the average actual increase showed any variation on the average normal increase relating to the two ages we are dealing with

I first worked out the average ages of these boys on joining and leaving and that worked out to a fraction over 14½ to 16½ I then worked out what the standard normal increase should be between those particular ages for the three measurements Lastly I worked out the average actual increase and compared these with the normal To put it more clearly we might say that it was found that the normal increase for boys aged 14 years and 7 months to 16 years and 7 months together with the actual increase was something like this —

	Normal	Actual
Height	3¼ in	1¼ in
Weight	1 st 4 lb	1 st 12 lb
Chest expansion	3¾ in	1 in

These figures are in no way to be taken as correct

I found, therefore, that in the averages of 1,000 cadets the actual increase was more than the normal in all three respects, the weight showing the largest variation and height the next. On examining and tabulating my figures I remember noticing how the inclusion of a certain batch of about seventy boys altered the total result. They were just then leaving the college after a term of epidemics of measles and the like. The whole normal life of the college had been upset and their work, games and physical training seriously interfered with. This showed very markedly on their final measurements. They were the last of my series. The previous ones had, of course, left before this epidemic and those who suffered with them are not included.

As we have seen, health influences growth and excessive functional activity retards it, and so I think that these figures (which are admittedly not quite correct but are at least fairly representative) point to the fact that after all there is not so very much wrong with the training of cadets. In short, I feel that if aught is wrong these boys will not grow according to normal standards and even better than

On showing my figures to a master of one of our public schools he was prepared to dismiss the subject with the remark: "But then you are dealing with the pick of the nation." I have two observations to make on this. Firstly: Though it is true that we are dealing with 1,000 boys who on entering the Navy as naval cadets showed no gross abnormality and were sound, yet I think that we should find the prototype of the newly joined cadet in large numbers in the preparatory schools of England. I write from a physical point of view only. I do not imagine that the competition can be so great that there can be a large enough number of candidates who are able to pass the educational test and then give the examining medical officers opportunity to pick out the requisite number from a physical standpoint. Moreover, realizing how young they are at the time of the examination, I take it that it is quite simple to judge as to their being sound or not, but it is a very different proposition to give an opinion as to what their physique is likely to be in, say, five years time. If this public school master had really wished to criticize he should have mentioned the boy with some malformation, a club-foot, for instance. These may be found in public schools but not in naval colleges. These unfortunate ones are unable to play games and take the prescribed course of physical training and this would lower the school average.

Secondly, and it arises out of the first: The Navy is not engaged

in striving to produce a kind of super-bay [illegible] content with getting the best out of what material [illegible] of this paper is not to glorify a particular type [illegible] but to show that the engine is capable of standing the [illegible] of increasing in efficiency as its various parts [illegible] limited. The Navy does not want a race of giants. It will [illegible] as generous size is it has its limits. Large [illegible] why [illegible] mere weight and clumsy, with less fine contr[illegible] seems at the expense of function.

I said that I was only going to discuss results [illegible] may not be beside the point to mention a few of the symptoms one might expect to find in cases of overstrain. I have [illegible] mentioned certain conditions of mind and body under th[illegible] of sickness; other signs or symptoms might be anæmia, loss of sleep, loss of appetite, nervousness. Perhaps it will not be [illegible] if I make a few remarks on each of these in detail.

Anæmia.—If seen it all is a very temporary affair, usually the result of some illness, and easily dealt with.

Loss of Sleep.—Not I think, a very common complaint. The cadet goes to bed tired, and an excellent thing it is that the [illegible] He also sleeps till he is roused in the morning—a still more excellent thing. I have seen cadets turning out a little subdued perhaps, until they have been through the cold plunge; but a few minutes later their attitude would certainly not lead one to suspect that they were suffering from lack of sleep. At least one Dartmouth master told me that he considered the hour's study before breakfast to be most valuable. I regret that I did not pursue the subject further.

Loss of Appetite.—This, of course, appears at the onset of any illness, and appetite rapidly returns with convalescence. I have yet to meet the cadet who makes this his first complaint, and if I did I would pay serious attention to it. If any one would care to prove that loss of appetite is common or uncommon in the cadet let him pick out a party of any number at random. Let him entertain that party to tea on any day he may choose. Probably his first feeling may be one of almost fear, which will gradually give way to one of admiration, and he would come away from his experiment quite happy on this score.

Nervousness.—A comprehensive and bad term. I am rather at a loss to know what to include under it. Is it shyness, especially in the presence of older people? That is not a failing in the cadet. He has a wholesome respect for those in authority, but I was much

[illegible] not be apparent to those in authority [illegible] any marked degree. Is it a want of [illegible] It is difficult to define and discuss, but I am certain [illegible] needed by those who know them that cadets have [illegible] both mental and muscular control.

In [illegible]—I hope I have made it clear what end I set out [illegible] and the means I have taken to get there. At the [illegible] well-being and interests of the young of the nation [illegible] Naval Arm of Empire, as they have been very rightly [illegible] look like being really and efficiently catered for, both in the better training of their brains and in the no less important particular—their bodies. Surely, if there is anything wrong with the training of the future naval officer now, too, is the time for looking into the question and reforming if need be.

The subject of the training of naval cadets is most absorbing, and I can only feel how inadequate this attempt to defeat a certain [illegible] is and must be realizing that I have only approached it from one point of view, and realizing that there are others which [illegible] not discuss as they lie entirely outside my knowledge and [illegible]

WITH A ROYAL MARINE BATTALION IN FRANCE

By Temporary Surgeon Lieutenant Commander Ross, M.C., M.D., R.N.
Medical Officer, 1st Battalion Royal Marines (Light Infantry)

With a wider or larger experience of men
Than falls to the lot of most of the sons of Marius.

ON joining the Battalion some two years ago to my extreme embarrassment I quickly discovered that a battalion medical officer was not only supposed to have a certain elementary knowledge of medicine and surgery, but was also suspected of being an expert sanitarian and a first-class mess caterer, in addition to showing an intelligent appreciation of the tactics and strategy of modern warfare. In order to hide my colossal ignorance of certain of these very specialized subjects I have perforce to adopt the attitude so commonly adopted by Hindus—saying little but appearing to think much—until such time as I was able covertly to assimilate a little knowledge from that all round expert, the adjutant.

The duties of a battalion medical officer on active service are both varied and interesting. He is, first and foremost, the sanitary adviser to the commanding officer. In other words, he is an M.O.H. of a community of approximately a thousand souls who live under conditions absolutely unknown in civil life. Prevention of disease, not treatment, is what must be aimed at. This is done by anti-typhoid and anti-cholera inoculations, chlorination of all drinking water, efficient disposal of excreta, urine and kitchen refuse, strict supervision of issue, quality and cooking of food, frequent inspections for scabies, lice, and personal cleanliness, and last but by no means least, care of the feet.

Next in importance comes treatment of sick and wounded, and training of the battalion stretcher bearers.

In addition he is possibly battalion gas officer, and probably mess caterer for the headquarters officers' mess.

For those whose knowledge of the medical personnel of a battalion is somewhat vague, it may be as well to summarize briefly what men the medical officer has at his disposal:—

(1) A corporal and four men of the medical unit, whose primary function is to look after sterilization of drinking water, but who also assist in the aid post.

(2) A lance-corporal from the battalion, who acts as orderly, and a private who drives the medical cart.

(3) Sixteen stretcher bearers, four attached to each company, and possibly a lance-corporal in charge.

(4) A sanitary sergeant attached to headquarters, and eight sanitary men, two attached to each company.

(5) A chiropodist to assist in looking after the feet of the men.

As so much has been written during the past two years about wounds, that any remarks made regarding their nature are open to the criticism of being merely a repetition of former conclusions, I am avoiding any

mention of the varied and ghastly wounds it has been my lot to treat. In this paper I propose to deal only with active operations, omitting the many interesting medical conditions and sanitary problems which arise in rest billets and during the routine occupation of trenches.

Preparations for the Attack.

Before a battalion takes over a portion of the line with a view to an attack, it is usual for the commanding officer and company commanders to visit the sector and gain what information they can, both from the occupants and from personal observation.

The commanding officer then issues a secret operation order giving details of the time and method of relief and the disposition of the troops. In addition an officers' conference is held at Battalion Headquarters, at which any obscure points are cleared up and the mode of attack is explained.

Secret orders are also issued to all medical officers by the A.D.M.S. of the Division explaining the arrangements for the evacuation of wounded.

The points of interest to the battalion medical officer are the situation of his primary aid post, the advanced dressing station of the field ambulance and the collecting point for walking wounded. He also must know the location of the advanced relay posts and bearer subdivisions, whose duty it is to evacuate wounded from the regimental aid post. In addition he must fully understand the position and nature of the objective assigned at in order to formulate a rough plan as to when he will move his aid post and where to.

Numerous other things must be carefully attended to. It must be ensured that every man in the Battalion is in possession of a first field dressing. The medical personnel cannot carry a large supply of dressings, and so the covering of a man's wound may be dependent on his possessing a first field dressing.

Each battalion has eight stretchers. These have to be carefully examined to see that they are in perfect working order and arrangements must be made that the bearer subdivision of the field ambulance can supply many more when required. An adequate supply of first field and shell dressings must be served out to all stretcher bearers and medical unit ratings.

The importance of every man thoroughly applying whale oil to his feet before going up to the trenches must be impressed on all company and platoon commanders. It undoubtedly has the effect of greatly diminishing the number of cases of so-called "trench feet."

My own kit for an attack consists of a Wilder's hypodermic syringe, a bottle of morphia solution, two water bottles, one full of brandy, the other of water, a haversack containing shell dressings, tourniquets, and a few instruments, and an abundant supply of cigarettes.

Duties during the Attack.

In brief these are —

(1) Prevention of shock.
(2) Alleviation of pain.

(3) Quick transition to the advance [illegible] ambulance.

(4) Mitigation of sepsis.

Sepsis.—Prevention of sepsis was [illegible] of modern surgery. In trench warfare [illegible] general rule it may be said that every [illegible] septic [illegible] septic but itself and however soon after the [illegible] of the [illegible] antiseptic he applied. The opportunity [illegible] of thorough [illegible] ing a wound a few minutes after it has [illegible] ved. My experience goes to prove that iodoform antiseptic [illegible]—iodoform powder [illegible] tolline and iodine chloride antiseptic [illegible] the result is almost [illegible] varying degree the same as the iodoform [illegible] I have never been able to make up my mind that any one antiseptic has any great advantage over another in influencing the course of a wound will take. It appears probable that the healing of wounds depends more on the so called physiological resistance of the patient than upon the virtuosity of antiseptics used.

In the South African War the main reliance in the first field dressing and painted the wound with iodine was [illegible] upon as the saviour of the patient. In the present War all that can be expected of the first field or shell dressing is to prevent the continuance of any further gross contamination.

Shock.—The vital importance of alleviating pain and hence diminishing shock cannot be over estimated. In the first aid treatment of all severe wounds the medical officer must mainly concentrate his attention on combating shock. The high nervous tension of a soldier both before and during an attack greatly increases the degree of shock he experiences when wounded. The belief that he is invulnerable is rudely shattered and his mental equilibrium is proportionately upset. This, in addition to the pain of a severe wound, produces the extreme degree of shock which is not met with in somewhat similar injuries in civil life. It is an exceedingly common impression amongst both officers and men that a compound fracture of the upper half of the femur is necessarily fatal. My experience, perhaps unfortunate, is that a very large number of such cases die of shock either at the regimental aid post, the field ambulance or the casualty clearing station. On one occasion I had two officers both wounded by the same shell and each sustaining an uncomplicated compound fracture of the humerus. One had an injection of morphia within five minutes, and the other within ten minutes of being wounded, and yet both died of shock on the following day at the field ambulance. These two cases are however somewhat exceptional and are only given to illustrate what a large factor shock can play in modern warfare. Most cases which are given morphia *early* respond in a remarkably gratifying manner. My practice is to give half a grain hypodermically to every stretcher case and I have found it eminently satisfactory. It is difficult for anyone who has not actually seen men wounded and followed the course of the cases to appreciate fully the degree of shock which is always associated even with trivial wounds.

Looking back on two years of fighting I must admit that my prognosis has become very much more guarded than it was when I first joined the Institution. This change is entirely due to bitter experience.

Evacuation of Wounded — The primary object of a battalion is to fight [illegible] which all else must be subordinated, and all is [illegible] vient to the exigencies of the fight. This is the reason why quick [illegible] on of wounded from the battlefield is essential. The battalion medical officer collects the wounded in its sheltered spots as he can find. The ambulance bearer subdivision evacuates them by stretcher to the advanced dressing station of the field ambulance, from whence they are sent on by motor ambulance to the main dressing station of the field ambulance and then to the casualty clearing station from where they are despatched in hospital trains to the base hospitals.

In all actions there are a large number of walking wounded cases. These are directed to make their way to a collecting point from where they are sent by motor lorry, G.S. wagon or other transport to the railhead and thence to hospital.

As the supply of stretcher squads is not inexhaustible every man who can possibly walk to the collecting point is made to do so. Many, who appear quite exhausted, are able to walk slowly down after having a cigarette and a tot of brandy. This is the reason why I invariably carry a supply of both.

Impressions of the Attack.[1]

Dawn is just breaking and a thick mist envelops everything. The companies are all waiting in their jumping off trenches for "zero" time to arrive. The commanding officer, adjutant and medical officer are in a trench a short distance behind. Zero time arrives. Bang—bang — bang, bang, bang — bang, bang — go the field guns; Crrr—ump — crrr — ump go the howitzers; shrapnel bursts overhead and machine gun bullets whizz past. The artillery have formed a barrage under cover of which the infantry advance on the enemy trenches. The barrage slowly creeps forward and men unconcernedly follow it. Up go the Boches S.O.S. rockets until the scene resembles a Crystal Palace Brock's benefit night. The enemy artillery quickly reply to the frantic signals of their infantry and *then* barrage opens. Many of our men fall some dead, others wounded. The remainder push on and are in the Huns front line directly our barrage has passed over it. Then bombing of dugouts and hand to hand fighting ensues. Many of our men fall but few of them before doing all or even more than all of what is expected of them.

The first objective being taken, headquarters has to be advanced. The scene in "no man's land" is indescribable. The ground is a mass of shell craters and almost impassable. The cries of the maimed and dying mingle strangely with the shriek of our own shells overhead and the explosions of hostile shells around us. That period of waiting sufficient to try the hardiest, is now over. The medical officer has his time fully occupied injecting morphia into the badly wounded, whilst his orderly affixes tablets marked with the dosage. Shell dressings and first field dressings are quickly applied and the wounded are collected into

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[1] Owing to censorship regulations this is not a description of any one particular attack, but is a poor attempt to portray the impressions got from the numerous times this battalion has been over the top.

groups in any spot which affords some shelter [illegible] which are bursting around. The ambulance bearers con[illegible] by the cases back to their advanced dressing station.

The battalion medical personnel has to push on [illegible] to keep in touch with the battalion but on the way numerous casualties are [illegible] treated and got into cover.

Large batches of prisoners are now beginning to come across [illegible] mans land. These are at once commandeered to carry wounded [illegible] Most of them appear only too willing to do so; those who object [illegible] quickly shown the error of their ways.

On getting into the German trenches it is exceedingly useful [illegible] German aid post can be located and taken over. A red cross flag [illegible] into the ground over it to indicate the position of the battalion [illegible] officer to walking wounded and stretcher bearers. On entering the aid post it is usual to find that the German medical officer has [illegible] behind with his wounded. On one occasion I had three Boche doctors in different dugouts working under me. The German doctors are [illegible] different from their comrades at brethren. I have found that they treat all wounded regardless of their nationality. They are doctors first [illegible] Boches a long way afterwards.

The next procedure is to collect all further wounded into this aid post or other places of comparative safety from where they can be evacuated later by the field ambulance bearers.

The battalion has now reached its final objective and the medical personnel, having collected all wounded, joins it in the new line which is being dug.

Suddenly the enemy opens a furious barrage. Large numbers are [illegible] congregating in front of us. They are advancing to counter attack and drive us out of our new positions. Our artillery liaison officer picks telephones back to his batteries. We open fire with machine guns, Lewis guns and rifles and await events. There are a few minutes of suspense and then our deadly artillery barrage opens. The enemy line is soon to be greatly thinned it wavers, and the remainder ignominiously take to their heels. Our barrage lifts slightly and [illegible] that remainder. The night is spent in consolidating the new line and repelling further counter attacks.

The Relief

On the following morning we are relieved and the battalion now sadly diminished in numbers wends its weary way back to billets. The men though tired footsore, lousy unshaven and caked with mud from head to foot are remarkably cheery. The last two days is a thing of the past, and hence forgotten. They live for the present, and the thought uppermost in every man's mind is that their efficient quartermaster will have a tot of rum for each one of them on their return to billets. This expectation is realized and ripping themselves up in their blankets they are soon enjoying a well deserved night's repose.

On the following day sitting in a partially demolished village just behind the trenches one attempts to fathom the mysteries of the British soldiers nature and fails miserably in the attempt. How [illegible] seems that those cheery high spirited fellows sitting in the local

[illegible] cigarettes, each with his glass of mineral water blank puffing [illegible] coyly at the inevitable woodbine, and making amorous advances to the delightful French girls, were only yesterday face to face with a [illegible] imminent death and had, by their reckless devotion to duty, added a fresh lustre to the traditions of their already famous Corps.

The psychology of the soldier is truly beyond the comprehension of most of us. They ruthlessly kill Boches and endure the mental agony of being face to face with almost certain death, but still on the following night these hardened warriors the tragedy of it all forgotten are found sitting in the dry-nosal cinema shrieking with laughter over the [illegible] antics of their prime favourite Charlie Chaplin.

They never complain but still each man has his "grouse." Calls us Hooning light infantry they does. I feels more like a Christmas tree" ironically soliloquizes an old soldier manfully staggering along carrying the innumerable appliances of modern warfare. Call digging a fatigue and the "grouse" becomes pronounced call it a working party and there is hardly a murmur. Tell them they are going over the top to-morrow and no man however ill he may feel reports sick. Suggest a long dry route march in the back area and many develop strange and awful complaints quite unknown to the medical faculty. I eats well and I sleeps well but as soon as I hears of this ere march I feels all over [illegible]" is how the patient describes his symptoms. The prescription of "Ol' No. 9 pill three times daily until cured" is the polite way in which the hard-hearted medical officer tactfully informs his would-be patient that his ailment is purely imaginary. This remedy has a remarkably efficacious effect.

On one occasion adopting a very lowly attitude I made a strategical advance to see a wounded man lying in the open. I found him nursing a badly fractured jaw, and having in addition numerous other wounds. He did not complain of his pain he never mentioned the shell fire or cold but did not even ask if the wound was likely to be fatal his only question was "Is my false teeth all right sir? I paid two thirteen nine for them just afore war." The assurance that his lower dentures was intact had a remarkably sedative effect on him and undoubtedly increased his chances of recovery.

In a recent operation I found a man lying wounded in a shell hole. "Blighty one this time sir," he said cheerily, doubtless thinking of the two previous occasions when he had been wounded and got no further than the casualty clearing station. He had a compound fracture of both femora and died in the field ambulance on the following day. "Don't waste time over me doctor I'm done in there's plenty of others wanting you" casually remarked a severe abdominal case on a very busy morning. All he would accept was a cigarette—he died peacefully ten minutes later, puffing contentedly until the end.

An officer came into my aid post one night with a man of his platoon who was suffering from a fractured leg. After the somewhat lengthy operation of immobilizing the fracture between a rifle and a pick handle I was somewhat surprised when the officer apologetically asked me to look at his eye as he had got "a bit of mud or something in it." On examination it was obvious that his sight in that eye was irretrievably lost. He walked down to the field ambulance behind the stretcher

bearing the men encouraging him to stand the pain and making light of his own much more serious injury.

Such incidents as these could be multiplied indefinitely, but they would only go to show the courage, endurance, unconscious humour and unfailing optimism of the soldier when confronted by the unutterable tragedy, suffering and horror of a great war.

Back in rest billets we see much of the French. Both old and young are quite irresistible. The dapper who coyly calls a stern battalion commander, "mon beaucoup *beaucoup beaucoup* brigand," her mother in an ebonistone the wedded officer, "mon petit enfant," the little fellow who sells the *Daily Mail* in these ruined villages shouting "paper" in the most approved Fleet Street style, the girls who reply to one questions with an invariable "après la guerre," or "no bon for the troops," the polite *en permission* who gives us exceedingly made souvenirs de Boche, and the old man who unconcernedly ploughs the fields a few miles behind the firing line—all are typical of the French.

At first the regular Tommies were somewhat surprised to find that they do not live entirely on a staple diet of frogs and dry champagne, as they were so gravely assured in our school days. We find them an exceedingly temperate race who eat what we eat and drink what we drink. They have the same amusements as are most of our good qualities, and what is more, we even more closely to them—a few of our failings. They possess all the attributes which we complacently used to consider peculiar to the British nation.

At first the common bond of friendship was the cause for which both nations were fighting. Now in addition there is the much more intimate bond of personal respect, admiration and affect in between individuals who have received kindnesses from one another which can never be forgotten, who have fought and died side by side, and who as a result of the War appreciate and honour one another.

The comradeship between our navy, cosmopolitan soldiers and the Flushing village maidens does more to cement the entente than the most eloquent speeches at Westminster.

The marine spends his off duty hours helping mademoiselle to draw water from the well, carrying her buckets home for her, feeding the cows, cleaning the farmyard and helping her generally in his own inimitable style. He asks for no reward, but feels amply repaid if she deigns to accept his services and allows him to bask in the sunshine of her smile. She, knowing instinctively he can be trusted, does her best to entertain him during the few days he is back in billets, and they finally part with mutual regrets.

The War has undoubtedly broadened the Britons outlook on life. His patriotism is no longer the old Jingo patriotism of former days, but is a real and personal thing entailing hardships and sacrifices hitherto undreamt of and often even death—the supreme sacrifice of all.

Clinical and Practical Notes

RUPTURE OF SPLEEN—SPLENECTOMY.

By Lieut Surgeon J SHAND RN

[illegible] seaman aged 19 was admitted on March 2 1917 with [illegible] history About 5 p m on the previous day he fell down a [illegible] the engine room in to a grating, about 10 ft He got up on [illegible] rested for a while and then owing to some abdominal pain he [illegible] his bunk On the following day the pain continued and he [illegible] shore to the Dockyard Surgery He walked from the boat to the Surgery a distance of about 600 yards He then had a temperature of 96 F pulse rate 96 and acute abdominal pain Urine had been passed and appeared normal

On admission Patient was shocked and very pale Temperature 98° F pulse [illegible] Abdomen was distended, generally tender and rigid Both flanks were dull There were one or two scratches over the left lower ribs but no other sign of bruising Pain was rather more acute in the left hypochondriac region His bowels had been opened The urine was drawn off and showed a trace of albumin Operation was performed as soon as possible

Incision left paramedian from the rib margin to well below the umbilicus Abdomen was full of dark blood which was rapidly cleared out and abdominal contents examined The spleen was found to be ruptured in front from the anterior to the posterior border in two places which were joined by another rupture the whole being like the letter H Suturing was out of the question and I proceeded to do a splenectomy The abdominal incision was extended out along the subcostal border The spleen was lifted out and the pedicle clamped and ligatured with strong silk after removing the spleen It was found impossible owing to bleeding to deal with the pedicle before lifting the spleen The abdominal cavity was dried and some hot saline was poured into it The lateral incision was secured by through and through sutures, but the anterior was secured in layers Two pints of saline were given intravenously during the operation

The spleen weighed 9 oz probably enlarged from blood clot There was no history of any disease to account for this enlargement

Continuous rectal saline was given when he rallied from the operation His temperature was 98° F Pulse soon became more rapid and full On the day after the operation he was given milk and warm water in small doses and on the following day weak tea and milk Calomel in grain doses every hour for four hours was also given Stitches were taken out on the tenth day and except for two small stitch abscesses in the lateral incision the wounds had healed

Recovery was uninterrupted His urine for some days showed a faint trace of albumin

Blood examination on the 26th inst White count 18,000 Red count 3,000 000

Differential count: Polymorphs, 59½ per cent; Lymphocytes large, 17½ per cent; Lymphocytes small, 21½ per cent—total, 39 per cent; Eosinophiles, 4 per cent; Transitional, 1 per cent.

There was no enlargement of any lymph glands. On the 29th he was sitting up in bed and was doing leg exercises and on the 30th he was up in a chair.

Blood count on April 8: Red count, 5·4 million; white count, 17,000. Polymorphs, 68½ per cent; Lymphocytes, large, 8 per cent; small, 18½ per cent, total, 26½ per cent; Eosinophiles, 1½ per cent; Mononuclear, 11 per cent; Transitional, 4 per cent.

The patient being a merchant seaman was discharged to his home quite well, on April 12.

CLINICAL NOTES ON WAR BURNS

By Fleet Surgeon CHRISTOPHER [illegible] WILKINSON, M.B., R.N.

In the recent article by Surgeon Wakeley on War Burns[1], he states that with regard to those on the wrist and fingers the general rule holds good that the flexors overcome the contractions of cicatrices on the

extensor surfaces. The [illegible] of the hands of one of the men belonging [illegible] by cordite explosion at the Battle [illegible] exception to this rule.

[illegible]

It is here [illegible] on the extensor surfaces [illegible] over extension [illegible] on the metacarpals [illegible] to the [illegible] of the middle [illegible] on the first. Indeed the [illegible] appearance of the [illegible] is [illegible] nubis what is seen in old [illegible] the ulnar nerve or in [illegible] muscular atrophy when [illegible] deformity the so called [illegible] is produced.

Fig.

I should like to endorse what Surgeon Walkley says as to the disadvantage of aseptic dressings, have over picric acid in the after treatment of burns. At the beginning of the War a large number of burns, the result of shell and mine explosions, were treated at Shotley Hospital and after an extended trial of various applications, a eucalyptus ointment was finally settled on as most soothing to the patient and sufficiently antiseptic and deodorant for all practical purposes.

A CASE OF ACUTE PANCREATITIS

By Temporary Surgeon C. P. G. Wakeley, R.N.

Cases of acute pancreatitis are not very common, at least so far as statistics go. This may be due to some extent to the fact that cases are not always recorded. Korte [1] collected 103 cases in seven years with a mortality of 60 per cent. and Moynihan [2] has reported eleven cases with four deaths, seven out of the eleven being diagnosed as cases of acute pancreatitis before operation. Therefore I think that this case is worthy of note, if only from a statistical standpoint.

The patient aged 40, was sent from his ship to R.N. Hospital South Queensferry in May, 1916 suffering from acute abdominal pain supposed to be due to acute suppurative cholecystitis. He gave the following history. He had been at sea for the greater part of his life and, except for several attacks of malaria, had enjoyed good health. There was a history of alcoholism. He was suddenly taken ill the day before admission to hospital with acute pain in the belly and vomiting, the vomiting had been very persistent in character and was bile stained. The patient was somewhat collapsed when I saw him and looked ill, the face was drawn, the lips blue, temperature 100, pulse 104. The urine was found to be normal. There was no jaundice or any previous history of it. On examination the abdomen was slightly distended and there was a circumscribed resistant epigastric swelling, painful on palpation, slightly to the right of the middle line. The spleen could be felt below the left costal margin and there was dulness in both flanks. As the patient's bowels had been confined for the last three days a simple enema was given, but this was not retained. The condition was considered to be acute suppurative cholecystitis, so I opened the abdomen through the right rectus using Mayo Robson's gall bladder incision. On opening the peritoneal cavity a quantity of blood stained fluid escaped. The gall bladder was easily found, but was not greatly distended and no stones could be felt in it or its duct. The tumour was found to be in the lesser sac, so the lesser omentum was carefully torn through. A large blood clot and pancreatic slough were found and removed. The pancreas was swollen and felt "boggy" to the touch. With the aid of a dissector an opening was made into the head of the gland and a large drainage tube and gauze wick placed in the lesser sac leading down to the pancreas. The duodenum was somewhat distended, no doubt due to the pressure of the hæmatoma in the lesser sac. The common bile duct was normal and contained no stone. The abdomen was closed. The drainage tube was removed after five days and except for a little excoriation of the skin around the drainage tube the wound healed by first intention. The man was very fit when he left hospital and I have since heard from him. He is quite well and back in his ship.

Rendle Short [3], who gives a very excellent review of the literature of these cases, states that cases of hæmorrhagic and gangrenous pancreatitis are very grave indeed and seldom recover.

Death rate after Operation for Acute Pancreatitis.

	Cases	Cured	Died
Moynihan	11	7	4
St. Thomas's Hospital	16	7	9
Middlesex Hospital	8	2	6
Bristol	7	0	7
Norwich	7	0	7
Korte (literature)	103	11	92
Korte (personal)	31	18	16

In my case the patient was operated on early, the second day whereas some of Korte's cases were not operated upon till a much later date.

No doubt if the [illegible] of [illegible] only an abscess of the lesser sac would have formed two such cases have been reported by Bittorf [4] in elderly men who have suffered from abdominal symptoms

REFERENCES

1 Kuhne *Lancet of Surgery* 1912
2 Moynihan Sir B — Abdominal Operations vol ii 1911
3 A Rendle Short Index of Diagnosis 1917 p 384
4 Bittorf *Munch. med. Woch.* 1913

A CASE OF ACUTE ANGIO NEUROTIC ŒDEMA FOLLOWING A DOSE OF "KHARSIVAN

By Surgeon RODERICK T G PARNELL, R N

AND

Temporary Surgeon W C P WHITE R N

Toxic effects following treatment by arsenic compounds are well known Our excuse for publishing the following notes must be, we think that no case similar to that described below has yet been recorded nor had we heard of one until Staff Surgeon Paul Fildes R N V R, gave us particulars of an almost identical train of symptoms occurring in a case under his care The two cases as far as we know are unique and their similarity is very marked both fortunately recovered

A stoker aged 25 was admitted to Haslar suffering from primary syphilis Examination showed him to be a well developed man Heart lungs urine alimentary and nervous systems were all normal His weight naked was 130½ lbs On October 29 he was given 0 5 gram of kharsivan The same evening his temperature rose to 99 6° F and he developed a well marked Herxheimer reaction Next morning his temperature was normal and all traces of reaction had disappeared On November 4 he was circumcised On December 8 (forty days after the first injection) he was given 0 3 gram of kharsivan During this injection it was noticed that he was somewhat restless but however made no complaint at the time and it was presumed that he was merely nervous as patients often are Twenty minutes later an urgent message was received from the ward to the effect that patient was very ill He was found in the following condition Collapsed with an almost imperceptible pulse face swollen and somewhat cyanosed the lips and eyelids being edematous the lips especially so he was unable to speak and very restless but there was no dyspnœa Very soon he began to secrete saliva with great freedom so much so that he was thrown into paroxysms of severe and distressing cough due to the saliva getting down the back of his throat After about five minutes he was able to speak in a whisper and complained of pain in the throat over the heart and in the pit of the stomach Treatment ether (m 20) was injected intravenously minims of a 1 in 1 000 solution of adrenalin were given hypodermically The foot of the bed was raised and a pint of saline injected slowly into the rectum He was turned on his side to aid the outflow of saliva a towel drain was inserted into his mouth Gradually he improved The œdema was obviously less one and a half hours after the onset of

symptom [illegible] poured, but the voice was still feeble. [illegible] local mucous membrane of the cheeks [illegible] half hours after the injection the voice [illegible] and cough were less; the pulse of good [illegible] headache and was inclined to sleep. [illegible] the lips and eyelids, his condition [illegible] to give some account of his experience. [illegible] injection he noticed a taste of the [illegible] passed off before the injection was completed. [illegible] from the table on to the stretcher [illegible] once more they passed off—but when [illegible] ced again and persisted with [illegible] in the chest and in the pit of the stomach [illegible] stood was going, and he attracted the attention [illegible] attendants who at once sent for medical assistance. [illegible] that immediately on getting back to bed he noticed [illegible] and this was followed by a feeling of his face swelling up.

He slept well during the night. Next morning he had completely recovered—his appearance was normal. Two days later some glands behind the angle of the right lower jaw became enlarged and tender, but these resolved in forty-eight hours.

Dr. Hildes account of his case is as follows:—

"The following are the details of a case which occurred two years ago. They are described from memory.

The patient was a powerfully built military officer aged about 30. He had a large penile chancre containing *Spirochæte pallida*, but no other manifestation of syphilis except a positive Wassermann reaction. He had been entirely untreated. The first dose of salvarsan (0·6 gram) was followed by a severe reaction, again which the patient had been warned in view of his clinical condition and disease of treatment. The patient shivered, but the temperature was not taken. On several occasions during the night vomiting and diarrhœa occurred, while in the morning a profuse macular syphilitic rash had appeared (Herxheimer). On the following morning the officer returned to duty. Ten days later a second dose (0·6 gram) of salvarsan was administered, slightly before dinner, and produced so little bad effect that the officer ate his dinner as usual.

"One month later a third dose (0·6 gram) was administered. All signs of syphilis were now absent. Within [illegible] minutes of the injection the officer referred to a tingling in his throat and was informed that this was common and without significance. When some six hours later he said that the tingling was getting worse and interfered with his pleasure, possibly being the cause. Within a further few minutes he stated with evident anxiety that the pain was going down his throat. Attention was now directed to the officer and he was found to be sitting on the bed with bloodshot eyes and suffused face. Events now followed with rapidity. His lips, face and eyelids became swollen and a watery material poured or was spat from his mouth. His breathing was extremely irregular, weak and rapid, and probably some cyanosis was present, although this was not a marked feature. He was in full possession of his faculties.

but has [illegible]
speak

'The [illegible]
but after [illegible]
find [illegible] the
[illegible] after the
[illegible] less
[illegible] very
[illegible] that
the [illegible] ous
It [illegible]
[illegible] cell but [illegible] He
felt co[illegible] rved no [illegible] Pa-
les on [illegible] face and [illegible] ex ts
It ca[illegible] without involving the
larynx [illegible] in this case

Th[illegible] nd was considered to
be a [illegible]

He [illegible] That the symptoms
are [illegible] The interesting
pa[illegible] ith cranial nerve for
[illegible] No laryngeal œdema
[illegible] have proved fatal
[illegible] ous In any case
[illegible] may be given a
[illegible] ntity when one
[illegible]

[illegible] ISION

[illegible] LAYE

[illegible] unconmonly
[illegible] al disease or to
[illegible] pleurisy
[illegible] clearness to this
[illegible] is In a
[illegible] of double
[illegible] s per cent of all
[illegible] being either
[illegible] vast majority of
[illegible] An example of
[illegible] ral (?) pneumo
[illegible] ly observed on
[illegible] SECONDARY
[illegible] TROUBLE [illegible] with NECROPSY

[illegible] aged [illegible] with tough pyrexia
[illegible] sweats—the [illegible] nished

[illegible] pulmonary tub[illegible] 1—6 oz clear [illegible] tubercle bacilli and [illegible]

On admission to R[illegible] 3 1916 he was extremely ill [illegible] pulse rate varying bet[illegible] subject to severe attac[illegible] his pulse became weak a[illegible]

The physical signs [illegible] to angles of scapulæ in [illegible] sounds could just be heard [illegible] lobes were normal—sputum [illegible]—it cont[illegible] pneumococci but no tubercle bacilli. The heart [illegible] displaced slightly to the right. Another grave feature [illegible] was advanced pyorrhœa alveolaris.

The right pleura was aspirated [illegible] drawn off it was sterile and contained very few [illegible] polymorphonuclear and mononuclear leucocytes in equal numbers. The chest was aspirated and 1½ pints of a further third [illegible] of the fluid relieved the patient's attacks but [illegible] and—he was kept alive by aspiration [illegible] every [illegible] days, the frequency and [illegible] of the [illegible]

On May 28 the doctor in the night [illegible] left lung to contain streptococci. He was [illegible] for resection at the upper part of the left [illegible] pints of clear sterile fluid drained so [illegible] patient had streptococcal pus in the right chest [illegible] left.

He died on July 9 four and a half months after the first onset of his illness.

The post mortem [illegible] tuberculous origin—the right lung [illegible] showed old caseating infiltration [illegible] lungs were free from tuberculosis. The secondary [illegible] streptococci prove [illegible] the detection of [illegible] in the pleura. The peritoneum showed terminal plaques [illegible] the intestines were adherent and studded with [illegible]

Case 8.—Double (?) Streptococcal Sero-fibrinous Pleurisy. Recovery.

A boy aged [illegible] after appendicectomy [illegible] developed acute purulent bronchitis [illegible] pneumococci.

On December 1 the bronchitis had gone but [illegible] he had signs of fluid at both bases. Both pleural cavities [illegible] at the same time [illegible] full of fluid easily obtained [illegible] The fluid was slightly turbid sterile and contained polymorphonuclear cells. The fluid was absorbed and the boy recovered.

I am indebted to Surgeon General W. W. Tryon, R.N., and Deputy Surgeon General V. G. Thomson, R.N., for permission to publish these notes.

NOTES ON AN EPIDEMIC OF INFLUENZA OCCURRING WITHIN THE ARCTIC CIRCLE

BY SURGEON JOHN FULLERTON, M.B., R.N.

An epidemic of influenza attacked the officers and men of H.M.S. [illegible] within the Arctic Circle during the month of December, 1916, and January, 1917. The first case developed on December 20, 1916. The epidemic reached its maximum on December 31. On that date there were [illegible] cases of influenza on the sick list, then a steady decline [illegible] number of fresh cases set in. The last case placed on the sick list was on January 11, 1917, and that case was discharged to duty on January [illegible]; since then no fresh cases have developed on board the ship.

Cause of Epidemic

(1) Severe arctic weather suddenly set in during the last two [illegible] of December. The lowest temperature registered was between [illegible] December 22 and 23, when the temperature fell to − 15° F. (47° of frost). [illegible] almost immediately rose to + 27° F. There was thus a [illegible] of 42° F. in the twenty-four hours.

(2) Owing to the severe cold weather, when the upper deck was [illegible] with warm water in the mornings a good deal of vapour [illegible] off, and the men were thus working in a damp atmosphere.

[illegible] was present amongst the shore population at this time, [illegible] contact with them was extremely limited.

Incidence.—The upper deck ratings were the first affected, but the epidemic soon affected all ratings indiscriminately. The following table gives the numbers and ratings, with days sickness:—

Rating	Number of cases	Days sickness
Officers	6	47
Seamen	33	150
Marines	11	19
Engine Room Department	27	101
Stewards, Cooks, Artisans	10	11
Totals	87	391

Symptoms.—The symptoms were a temperature of from 101° F. to [illegible], headache, backache, general malaise, and catarrh, accompanied with diarrhœa and slight vomiting. These symptoms lasted for about forty-eight hours. Then the temperature became sub-normal and normal for the next forty-eight hours. The average time on the sick list was [illegible] days. A slight naso-pharyngeal discharge was present in several cases.

Complications.—Two cases of slight dry pleurisy occurred, but it soon cleared up in both instances.

Sequelæ.—A large number of men complained of earache and of supra-orbital neuralgia during convalescence, but no cases of serious sequelæ developed.

Treatment

(1) *Medicinal.*—On account of the number of cases an overflow sick bay was made in the after part of the ship in the gunroom flat. This place was screened off and isolated from the rest of the flat. All cases

were placed in bed in the sick bay for [illegible] or until their temperatures fell to sub normal or normal. They were placed on a liquid diet. A large stock-pot was kept [illegible] the sick bay [illegible] to which tinct. ferri perchlor. in 15 min. [illegible] was added. In addition a 5 gr. tablet of quinine was given with [illegible] dose. An aperient dose of castor oil was administered as an initial measure. Where necessary Dover's powder gr. x was given in the evening. After forty eight hours, or when the fever had subsided, all cases were placed on a tonic of iron quinine and strychnine.

Routine.—All cases were kept in bed in the sick bay for forty eight hours, or until their temperatures were sub normal or normal. They were then transferred to the auxiliary sick bay in gunroom flat and kept in their hammocks and given a tonic mixture for forty eight hours. They were then discharged to light duty between decks for forty eight hours, and then full duty.

(2) *Hygiene.*—All the mess decks were scrubbed with izal. All the cases were isolated as much as possible, and any case with naso pharyngeal discharge was given an antiseptic nasal douch. Communication with other ships was restricted as much as possible.

(3) *Precautions.*—Arrangements were made so that the upper deck would not be washed down with water during the very cold weather, but only dry cleaned, also that when the upper deck was washed down the temperature of the water would be so regulated as to reduce as much as possible excessive vapour being given off.

I am informed that the type of influenza on shore showed severe pulmonary complications, pneumonia, pleurisy, &c.

A CASE OF EARLY MYXŒDEMA.

By Lieut. Surgeon F. J. Mahon, R.N.

In an address on "Naval Medicine in the Great War," given before the Medical Society of London in February last, Surgeon General Rolleston mentions that cases of hyperthyroidism seemed to have become more frequent in the Navy. As a footnote to that may I be allowed to cite a case of hypothyroidism at present under my charge and doing his full duty on board?

E., aged 32 years, joined the Navy as a boy aged 15½. Family history negative. His medical history sheet shows nothing but two attacks of gonorrhœa. No evidence of syphilis. On November 1, 1913 he came to the sick bay complaining of inability to take his food on account of the nauseating sweet taste which all ordinary articles of diet left in his mouth. He was very depressed and emotional, mental processes slow; voice muffled, hair falling out rapidly, palms of hands peeling freely. There was difficulty in walking, with ataxic gait and weak reflexes. Heart action weak, with pulse 50, low tension. Nothing abnormal in urine.

He had been working in the boatswain's store, where he had found difficulty in grasping things to pick them up. He also found he could not remember the usual place for things in the store.

[illegible] Sovereign [illegible] and lo[illegible] notes of the [illegible] nothing [illegible] wasting of [illegible] muscles but no [illegible] slow

He [illegible] iodide [illegible] A week later h[illegible] right and was able to [illegible] December 19 1913 al[illegible]

H[illegible] tooth good and sound with [illegible] of hair [illegible] ght and well and car[illegible] of a 13 gun most efficiently

He [illegible] for thyroid extract (B and W) once daily [illegible] have tri[illegible] tonic three days would supply the deficiency in his system [illegible] of a week had to return to the original dose [illegible] of fatigue and great mental depression When he go[illegible] takes with him a sufficient number of tablets for his daily [illegible] occasion he was unavoidably without the drug for four [illegible] suffered a partial relapse

The c[illegible] to me to be of special interest for the following reasons —

(1) On re[illegible] the spontaneous origin of the disease There being no history of [illegible], surgical battle, o[illegible] otherwise, and no evidence of syphilis

(2) The [illegible] the disease at 28 years of age in a male Murray, in Allbutt's System of Medicine gives the average age at which sympto[illegible] first appear as 35 to 50 in the male

(3) The successful result of thyroid extract in keeping this man fit for the Service, instead of the hopeless prognosis for such cases before its introduction

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WATER SUPPLY ON ACTIVE SERVICE—SOME DIFFICULTIES IN GALLIPOLI

By Lieut Surgeon ARTHUR GASKELL, C.B. F.R.C.S. R.N
Late ADMS of the Royal Naval Division

I.—Introductory Aphorisms

(*a*) Water supply is one of the most important details in sanitation

(*b*) Good sanitation is costly and cannot be obtained by legislation alone Legislation especially in civil life must be largely helped by educating the general public as to the importance of sanitary measures

(*c*) In the Services discipline should make sanitary administration easier to carry out

(*d*) In the Army non medical officers are instructed in hygiene and have to pass an examination in the elements of this science (*vide* V.)

II.—Practice is more Difficult than Theory

Instruction as to the theoretical means of ensuring pure drinking water on Active Service is crammed into naval and military medical officers during their various courses The finding of as clean a water as possible the protecting of it from pollution or improper use the rendering

of it sale by filtration [illegible] so simple and yet the experience [illegible] demonstrate to medical officers of [illegible] practice is not nearly so simple as [illegible]

III.—Water [illegible]

The writer coming straight from [illegible] appointment was full of ideas and determination that [illegible] to ensure a supply of safe drinking water [illegible] Naval Division Colonel Horlock R A M C kindly [illegible] Army water cart and it was decided that [illegible] cart used by the R N D The establishment [illegible] and a large supply of bleaching powder [illegible] obtained (N B Bleaching powder deteriorates [illegible] difficult substance to pack Some of the [illegible] provided On test boxes for estimating the [illegible] more useful but took time to use The [illegible] water cart must close mipped in oiled paper [illegible] so that the chlorine content remains [illegible] the whole process of water purification made more certain [illegible] simple)

During the voyage lectures and [illegible] demonstrations of the way to use the water cart were given The [illegible] supply of water for the cart, forming excellently [illegible] lighter filled with unused kerosene tins of [illegible] ashore and the first landing party, [illegible] sufficient [illegible] (N B [illegible] tin is more comfortable to carry [illegible] tin is the handle to not cut one's hand)

The Army scale of water carts for [illegible] probably correct for average operations provided [illegible] on the occasion and it was found that double the number would [illegible] better provision thus allowing for breakdown (which [illegible] frequent) and for easier distribution of the water [illegible] scattered camps &c Even the number of carts [illegible] not all been delivered when the Division sailed The billion [illegible] for an unit should be carried in the ship with the [illegible] during the voyage all hands should be [illegible] of the cart In the case of the R N D some [illegible] labelled troops and others chiefly vehicles [illegible] in the holds, and not seen during the voyage

The landing on Gallipoli Peninsula [illegible] and it was found necessary to reduce [illegible] of the vehicles and much other [illegible] the force By stress of circumstances therefore [illegible] R N D water carts were not landed and this unfortunately [illegible] much to the difficulty of ensuring a supply of pure drinking water

IV.—Instruction [illegible]

During the voyage the [illegible] Contingent distributed lectures by the various technical officers [illegible] were also called upon to give lectures on field sanitation [illegible] also an officer who had served several years in Turkish [illegible] the Turkish Government

[illegible] his [illegible] on the [illegible] that [illegible] typhoid [illegible] have to take the [illegible] precautions [illegible] in the peninsula. He emphasized the fact that [illegible] would be probably dangerous to drink. [illegible] however, that Turkey and the Turks stated that [illegible] export of [illegible] water than the Turk and that the [illegible] rest assured that the Turkish drinking water supply [illegible] absolutely safe. This unfortunate statement may have [illegible] of the officers to relax some of their vigilance concerning [illegible] of field sanitation.

V.—Non-existence of Facilities for Purification of Water.

After the landing on the peninsula the engineer unit of the R.N.D. took immediate steps to find water for the troops and a certain officer of that unit reported that he had found a magnificent supply of pure fresh cool water. Now this particular water was obtained from a pollen well and was certainly fairly plentiful but as it was nothing more than subsoil water and the whole peninsula was horribly polluted by the Turks and later on by our own troops and those of our Allies this water was from a bacteriological point of view little short of sewage effluent. Here then the R.N.D. had two military officers presumably trained in the elements of hygiene spreading most dangerous information and enormously weakening the most convincing arguments brought forward by the medical officers. Time after time the writer and all the other medical officers urged the dangers of the water supply then in use unless it was effectually treated but the little knowledge of the non-medical officers carried the day and proved proverbially dangerous.

VI.—Distastefulness of Chlorinated Water and Acid Sulphate Water.

The chlorinated water was unpalatable, the trouble of the process was too great, the appearance of the untreated water was so clear and pure that undoubtedly much untreated water was drunk and used for washing purposes, &c. The R.N.D. obtained a large supply of tablets of acid sulphate of soda and it seemed a most simple way of rendering innocuous the water in the water bottles. But the sickly sweet liquid thus produced was so unpleasant that it failed to attract men from the unpurified water.

VII.—Scarcity of Fuel.

Fuel was very scarce and consequently boiled water was out of the question.

VIII.—Water in the Trenches.

The water carts as already stated were too few in number and frequently broke down. They were too large and too conspicuous to be taken up to the trenches. Consequently, kerosene tins and various other portable water vessels were used and the water in these was often untreated.

[illegible]

[illegible]

[illegible]

The following facts re[illegible] amo[illegible] [illegible]

The [illegible] on the scene.

The writer was invalided [illegible] fever about this time and [illegible] afterwards the [illegible] into [illegible]. The deep wells were [illegible] too late to avert the [illegible] sickness from water[illegible].

X.—[illegible]

Education in hygiene should be [illegible] thorough. Every officer and man should have such a knowledge [illegible] that the energetic co-operation could be counted on. [illegible] should be very carefully organised, more especially [illegible] of a large number of medical officers and other [illegible] of lecturing in a local, interesting and impressive manner.

XI.—[illegible]

The reader must not be misled [illegible] into thinking that the water problem was a failure. [illegible] fact an enormous amount of good work was done by the medical officers and others, and although there was a high incidence of water-borne disease, this might have been much higher had not precautions been taken at every moment during the campaign.

As the title of the article indicates, only the difficulties are recorded here, and they are only recorded for the utilitarian purpose of future prevention.

THE [illegible] PROTECTED [illegible]

[illegible] TEMPERATURE [illegible]

In this [illegible] pipes are [illegible] and are not [illegible] is usually the case with [illegible] with insoluble [illegible] the water [illegible] no distilling has to be [illegible] before it has [illegible]

[illegible] may be this which [illegible] is very much [illegible] about 1 lb [illegible] tank so that [illegible] amount of [illegible]

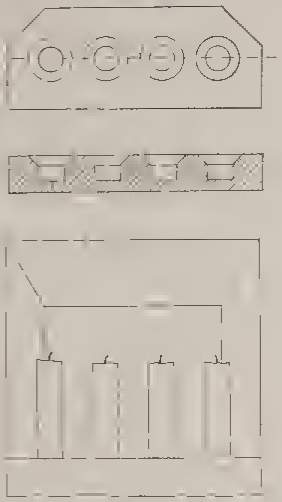
[illegible] the water alkaline and it [illegible] gas—probably an insoluble [illegible] action of the water. The [illegible] the coarse service towelling [illegible] lime is used to every 8 to [illegible] with phenol phthalein. This [illegible] solutions. It is a very [illegible] assumed from the depth [illegible]

[illegible] alkaline [illegible] requires renewing, and [illegible] ning the [illegible] most of the lime has dis[illegible] A certain [illegible] equal to the water but [illegible] 10 tons of water, it [illegible] will be classed as a very [illegible] less than 1 degree [illegible] more palatable [illegible] this ship it has [illegible] ship

[illegible] ACTION

[illegible] dependent on [illegible] about without [illegible] much less to [illegible] to obtate this the [illegible] or bend the ship [illegible] the outhead beams or hor[illegible]

[illegible] ship's candles and



small cutter is [illegible] of tin which [illegible] the tin are turned over [illegible] sling. It has let [illegible] satisfactorily.

ELECTRIC HEATER FOR THE AMBRINE SPRAY APPARATUS.

By Surgeon HORACE L. STEPHENS, M.B., R.N.

[illegible] ployment of ambrine or a medicated paraffin in the treatment [illegible] so generally recognized that the following note may be [illegible] of interest to those medical officers afloat who prefer the spray [illegible] their method of application.

[illegible] ple of the electric kettle may be applied to the brass spray [illegible] heating the wax to the required temperature by means of a [illegible] water bath. A brief description is appended. A thin cylinder [illegible] ted to the barrel below the level of the nozzle and handle on this is wound a heating resistance consisting of one spiral of the wire as used for a Bastian heater. This is covered with a second layer of mica and the whole enveloped in a neat metal jacket. The two terminals are placed just below the handle attachment enclosed within a small insulating hood which is held in place at the point where the handle screws on. The circuit is completed by a twin lead of cabin wire [illegible] ected to an adapter fitting the ordinary bayonet joint lamp holder. The nozzle may be covered with a thick layer of mica in order to soo[illegible] as much heat as possible at that point.

The wax melts quickly and the temperature is regulated by disconnecting the lead when required. A switch could be added, but would prove somewhat cumbersome.

The advantages of such an arrangement are: (1) No lamps or water required; (2) extremely portable and can be used in any part of the ship; (3) very simple to make.

The heater described above was made on board H.M.S. 'Lion,' by Chief Electrician W. A. Carter and worked admirably.

Reviews.

CENTRAL SURGERY—DIAGNOSIS FOR STUDENTS [illegible]
By F de Quervain Professor of Surgery at [illegible]
Clinic at the University of Basle Translated [illegible]
Edition by I Snowman M D Second English [illegible]
John Bale, Sons and Danielsson Ltd 1917 [illegible]
With 504 illustrations and 5 plates Price 3[illegible]

We heartily welcome the second English edition of this [illegible] book Only about four years have elapsed since [illegible] edition in this country, a fact which testifies to the [illegible] and its popularity The author tells us that his work [illegible] of years of association with students as a teacher and with [illegible] practitioners at consultations and that the methods of investigation he has employed are those available for the general practitioner [illegible] using bacteriological, serological, histological and radiographic [illegible] with out which a reliable diagnosis cannot be obtained One of the [illegible] distinctive of his methods of teaching is the plan as carried [illegible] the present work of starting with the symptoms which [illegible] patient to seek medical advice and of proceeding by stages until a final diagnosis is reached, a method which undoubtedly is to be preferred to that of deducing symptoms from a diagnosis already made

The exhaustion of the first English edition has coincided with the preparation of the fifth edition of the original from which the present translation is accordingly made Every chapter has undergone revision and the sections on diseases of the stomach and duodenum have been rewritten entirely Many matters of interest from the standpoint of military surgery have been introduced and the final chapter is devoted entirely to problems connected with military surgery There are no fewer than ninety two additional illustrations

The book is remarkably comprehensive and in this respect is an index of the author's wide experience, being the outcome of his own observations It is divided into seven parts each dealing with the diagnosis of regional surgical disease or injury Parts I, II and III on the head the neck, the thorax Parts IV and V on the abdomen and pelvic viscera—the pelvis and spinal cord Parts VI and VII on the upper extremity the lower extremity (including some general diagnostic problems in connection with the military surgery of the hobbs) The illustrations form a distinctive feature of the volume being numerous well produced and very instructive There are also many clever diagrams, some in colour, which represent with remarkable clearness the course of surgical diseases

The author writes in a lucid and easy style adhering throughout strictly to the subject of surgical diagnosis and does not touch upon pathology or treatment No fault can be found with the translation which is excellent in every way, and the volume is produced in a manner which reflects great credit on the publishers The book as a whole is

one of the best of [illegible] the [illegible] practitioner or student [illegible] ical dis[illegible]

Encyclopædia Medica [illegible] and Ed[illegible] under the general editorship of [illegible] M D C M F R C P E Edinburgh and L[illegible] Sons Ltd 1915 Vol i pp 714 illustrations [illegible] Vol ii pp 677 illustrations 10[illegible] Vol iii pp 672 illustrations 76, with 9 colo[illegible] illustrations 83, with 13 plates (5 [illegible] number of vols 12 Price 20s net per volume

This well known [illegible] Encyclopædia now enters its second period of existence [illegible] elapsed since it was first published The initial fo[illegible] in front of us and when the number is completed to lo[illegible] of the enterprise will be evident These books clearly [illegible] the subject matter has been entirely rejuvenated and bro[illegible] up to date Meticulous care and skilful judgment have been [illegible] hand in order that each individual article should reflect the [illegible] of modern thought We are not acquainted with any work in the English language which is so exhaustive and complete

Dr J W Ballantyne [illegible] the general editor's chair in addition to contributing several papers [illegible] The list of authors shows that every centre of medical education has been called upon to render assistance in the compilation of the Encyclopædia of Medicine

Each principal article has been [illegible] revised and enlarged, or else rewritten so that the amount of [illegible] matter is slightly increased The smaller subjects have [illegible] their need of attention and these contain much that is of practical [illegible] The alphabetical arrangement remains which promotes easy [illegible] always a difficult problem to [illegible] in a work of such [illegible] dimensions A bibliography is appended to the more important subjects [illegible] advantage of which is obvious The volumes are well and [illegible] bound while the type is clear and easy [illegible] The most striking [illegible] in this edition is the inclusion of a large number of diagrams and illustrations many of which are coloured The absence of these in the first edition was a notable defect which has now been fully rectified

As the whole field of medicine comes under review in this brief notice it is manifestly impossible to do more than mention the salient features of each volume By this means alone are we enabled to impart the scope and character of the work to our readers The outstanding characteristic of these volumes lies not only in the intrinsic merit of the individual contributions but chiefly in their all embracing quality To those who require a uniform library of sound medical literature written by the leading specialists of the present day compact complete and easy of reference we not only recommend this work but we know of no other

[illegible] *Bathers*—[illegible] Of the [illegible] articles in this volume ten are [illegible] Acute abdomen (2) abdominal section [illegible] accumulation [illegible] Basic anatomical [illegible] Functional pathology and asepsis [illegible] and [illegible] [illegible] subject [illegible] value [illegible]

[illegible]

[illegible] during [illegible] the [illegible] to date. Naval [illegible] particularly interested to know [illegible] a note on Ma[illegible]

It [illegible] attended with regard to [illegible] living quarters that in small vessels the [illegible] usually effected by means [illegible] could have [illegible] with the [illegible] to pro[illegible] [illegible] the smoke [illegible] In the [illegible] illy ventilated [illegible] at any rate [illegible] on the deck would be [illegible] states that the larger vessels [illegible] be best heated by steam [illegible] system [illegible] latter be [illegible] with the introduction of [illegible] on which [illegible] quite [illegible] the provision of [illegible] out in our Navy [illegible] appears to be that [illegible] but not heating [illegible] perhaps every low [illegible] heated by radiators [illegible] not intelligently [illegible] rise to the [illegible] shower baths [illegible] their cover [illegible] especially subjected [illegible]

[illegible] hygiene [illegible] are noticeable [illegible] adopted in this [illegible] opinion [illegible]

Mar[illegible] [illegible] Sickness [illegible] (Con[illegible] [illegible] the [illegible] By Sir [illegible] M.D. [illegible] Physician [illegible] and Temp[illegible] [illegible] A.M.C. [illegible] Medical Board [illegible] Medical Examiner [illegible] Metropolitan Water [illegible] Medical [illegible] Shipping [illegible] Office, and [illegible] Workman's [illegible] London [illegible] Illustrated [illegible] Price [illegible] net.

[illegible] written in the [illegible] and the [illegible] entirely [illegible] Chapters have been added [illegible] injuries

[illegible] disease [illegible] agnus and malingering [illegible] malingering [illegible] and malingering [illegible] Act 1906 [illegible] scheduled diseases return to [illegible] their impediments [illegible] recent legislature upon [illegible] chronic suppuration [illegible] prevention immobility [illegible] rheumatism and the [illegible] their relationship to [illegible] and themselves of the [illegible]

[illegible] to the [illegible] of which the cause [illegible] both of two forms [illegible] (1) [illegible] injury to body or [illegible] (2) chronic injury to the [illegible] in the form of worry [illegible] In the chapter on [illegible] no reference can be found [illegible] sexual system which is obviously of [illegible] importance in regard to cause [illegible] symptoms The chief differences between [illegible] and hysteria [illegible] the points which are common to malingering and hysteria are [illegible] Hysteria is defined as a disease [illegible] into suggestion [illegible] it is [illegible] conscious malingering which always [illegible] in the self deception [illegible] the heading of military and [illegible] the author gives impressions [illegible] he has been a member of the travelling medical board for the London [illegible] and is at present of the [illegible] board for neurasthenia [illegible] and [illegible] conditions and [illegible] shell and gunshot wounds alleged defective [illegible] and [illegible] and displacement of the semilunar cartilage [illegible] in the Army and on other subjects

Throughout the text cases illustrative of the points under discussion are given in detail all from the author's own observation The whole book forms very interesting reading being based on a wide personal experience It gives comprehensive information on a subject which of late years has become of increasing importance

ACUTE APPENDICITIS PRACTICAL POINTS FROM A TWENTY FIVE YEARS' EXPERIENCE By C Hamilton Whiteford, M R C S L R C P late Specialist in Surgery Military Hospital, Devonport London Harrison and Sons 1917 Pp 72 Price 4s net

The practical points in diagnosis and treatment of acute cases of appendicitis, which have presented themselves to the writer during a quarter of a century are embodied in this little work Diagnosis and difficulties in diagnosis occupy the opening chapters treatment and some post-operative complications being then dealt with With regard to the leucocyte count the author holds that it is of great assistance in diagnosis but that a count made by a novice is worse than useless because unreliable and apt to mislead His findings confirm those of other observers that the base of the appendix usually has ended or close to Lanz's point and does not correspond as a rule with McBurney's point Closure of the abdomen without drainage after removal of an acutely inflamed appendix is condemned omission of the drainage tube exposes the patient to a risk which being avoidable is unnecessary When the symptoms suggest that infection has spread beyond the immediate vicinity of the appendix the left side of the abdomen and pelvis is explored first through a vertical 3 inch incision over outer portion of left lower rectus if infection is present, the case is treated as one of spreading peritonitis but if the left

lower abdomen is normal, the incision closed and the [illegible] abdomen is dealt with through an iliac incision

This little book in no sense is intended as a compend[illegible] the disease It will be found, however, an aid to diagn[illegible] and to contain many useful hints with regard to point of [illegible] necessary in the [illegible] of a sane mind

PHYSICAL REMEDIES FOR DISABLED SOLDIERS By R Fort[illegible] Honorary Medical Director of the Red Cross Clinic [illegible] Treatment of Disabled Officers With chapters by M[illegible] Mckenzie R A M C Professor of Physical Education and [illegible] Therapy at the University of Pennsylvania Francis H[illegible] Johnson M D Senior Medical Officer to the X Ray, Electr[illegible] Massage Department Cambridge Hospital Aldershot C[illegible] Radiologist Aldershot Command and James B Meinell M [illegible] M D Civilian Medical Officer in Charge of the Massage Department [illegible] Military Orthopaedic Hospital Shepherd s Bush Medical Officer [illegible] to the Physico Therapeutic Department St Thomas s Hospital London Baillière Tindall and Cox 1917 Pp xii + 27[illegible] with 88 illustrations Price 7s 6d net

The appearance of this book, at this time, is welcome as recently physical methods of treatment have attracted considerable attention, and in one form or another have been adopted in many places throughout the country They are especially of use in the treatment and after treatment of wounds and other conditions produced by war They include the specialized subjects of hydrology massage electro therapeutics, radiology—mechano therapeutics remedial exercises and training and medical climatology which as a rule, are divided into rather water tight compartments, and as a result at times clash one with another The author by bringing these as it were, under one roof will be, it is hoped, successful in drawing attention to the necessity of bringing into closer touch those various subjects which are closely interdependent in attaining their common aim—namely, the restoration of function and the return to useful work of those unfortunately maimed by the War

Part I deals with hydrological remedies and the indications for their use The various forms of baths are described including the new Whirlpool Bath in which the water is set in motion by a turbine (protected by a guard) which revolves rapidly in the bottom of the bath The stimulating character of this bath may be further increased by the discharge of compressed air through the water The effect of these baths as also of the French Pan Courante baths is to stimulate the arterial circulation in the most powerful manner They have a marked sedative effect in relieving pain and muscular spasm, and may be given with advantage as a preparation for massage and movement The Sub thermal Sedative Pool Bath, at a temperature of 92 to 94 F, has been proved to be of great benefit to cases of shell shock, as also in cases of disordered action of the heart

In Part II are described the various forms of mechanical treatment as provided by apparatus chiefly designed by Dr Zander, of Stockholm Major Tait McKenzie who has done such good work for the Army in this

[illegible] to this section [illegible] it lays [illegible] very [illegible] is full remedial exercises for the different [illegible] Mennell in his chapter on the administration of massage [illegible] general outline of its functions and emphasizes the continuity [illegible] results are obtained from light strokings as compared with the [illegible] ding movements adopted by some schools Dr Hermann [illegible] good chapter on electricity and induction amongst other points, [illegible] attention to the necessity of avoiding fatigue of paralysed muscles [illegible] either by electrical stimulation or by massage as such [illegible] will undo what good the treatment has produced

In Part III on the Provision of Physical Remedies the author describes the equipment and organization of some establishments in this and other countries—notably at Davos, in France where the matter has been taken up thoroughly, not only from the treatment point of view but also from that of re education and work by which maimed soldiers and sailors are trained and taught some trade suitable to their disability with the aim that they may be made self supporting and not dependent on the State—which is of far reaching economic importance to the country in the future when peace is declared

The book concludes with notes on the various British spas and health resorts and their suitability for treatment of conditions prevalent not only during War but also in peace time

DISEASES IN NECK WEAR By Walter G Welford M D Author of Cerebral Congestion and Tight Neck clothing, &c London H K Lewis and Co Ltd 1917 Pp xii and 171 With 6 illustrations Price 1s 6d net

The writer of this little brochure is a convinced and most convincing advocate of loose neck wear He appears to some of his statements and arguments to use the arts of a special pleader but the sound truths of the principles he lays down in our opinion cover the short comings of the simple mantle of justification The loose neck wear of the civilian is provided healthiness are given as instances among many other of the advantages to be gained by following the author's advice In a certain number of officers affect wear tight neck things and suffer from [illegible] we can only say that statistics do not show that the old [illegible] are in any way less healthy than the men in the Navy [illegible] but of course there are many [illegible] quite apart from neck wear

Many apparently innumerous ailments are claimed in the pages of this work to have been affected by the simple process of relaxing pressure on the neck although this pressure was evidently often not [illegible] Headache epistaxis vertigo deafness [illegible] Bilious [illegible] drowsiness epilepsy apoplexy noises in the ears [illegible] and rheumatism are all said to have been very slightly if not immediately relieved and afterwards cured by loosening anything which constricts above the clavicles

The book is full of humour as well as sound advice, and we strongly recommend that it should be read without bias and an open mind

INTENSIVE TREATMENT OF SYPHILIS AND LOCOMOTOR ATAXIA BY AACHEN METHODS By Reginald Hayes M R C S Second Edition, revised London Baillière Tindall and Cox 1917 Pp vi + 88 With 4 plates Price 3s 6d net.

This is the second edition of a book written three years previously which is brought up to date to coincide with the changes in syphilitic treatment

The object is to advocate in some detail the principle and advantages of intensive treatment of syphilis by adequate mercurial injection It is observed that in early syphilis the best treatment consists of "606" preparations combined with intensive mercurial treatment but that in late syphilis owing to the failure of arsenical preparations to reach the entrenched spirochaete mercury retains its place

The author advises that mercury is best given by injection The technique of injection is described in detail and the methods of rubbing are illustrated by photographs A description of the Aachen treatment is given with advice as to how the full benefit of the treatment may be obtained at home The question of the advantages of injection over other methods is discussed and special stress is laid on the technique

The later pages are devoted to the treatment of locomotor ataxia and cerebral syphilis Intensive mercurial treatment by injection is advocated and again the necessity for thoroughness in detail is urged The treatment is illustrated by details of a number of cases which have been under the author's care The results obtained justify the treatment advocated Finally two pages are devoted to the question of cure and marriage which are well worth reading

This small book commends itself to all interested in syphilis treatment especially of the later stages It is well known that to obtain maximal results from mercury it must be given with method and care which result from experience This book supplies the medical man with methods of treatment of syphilis which in the past have made Aachen famous and which can now be carried out equally well under supervision at home

ELEMENTS OF NAVAL SERVICE By Commander Yates Stirling U S N Philadelphia and London J B Lippincott Company 1917 Pp 87 Price 8s 6d net

This book which has been prepared as a Manual for those who are [illegible] the U S Navy epitomizes a variety of information upon a [illegible] of subjects In Part I the author discusses naval policy [illegible] and strategy Part II is chiefly devoted to material Part III to organization of personnel Part IV to a description of some [illegible] professions in a Navy while in Part V miscellaneous [illegible] are discussed amongst those are first aid and hygiene forty four pages of which have been contributed by Passed Assistant Surgeon R W M Donald M D The book is very interesting and written in a most attractive style anecdotes of scenes in naval life being employed to illustrate the points brought forward

Abstracts and Translations.

Pick (W.) Simulation of Venereal Disease. *Wiener klin. Wochenschr.*, February 11, 1917. Pp. 148–151.

The author states that 5 to 7 per cent. of apparent venereal illnesses are really simulations.

(1) *Artificial Gonorrhœa.*—Gonorrhœa is the disease most frequently simulated. In simulated disease the discharge is frequently sticky and thin. Soap is frequently used, but as soap just now is of poor quality it is not completely saponify and a small piece can often be expressed from the urethra. It may also be found in the first portion of the urine.

In order to prove its presence put a piece into water and it bubbles. This impresses the patient and he confesses. Acids, cinnamon and tobacco are also used.

(2) *Artificial Balanitis.*—A membrane is usually found which is difficult to remove, the remains of a vesicle or an erosion may be found. Suspicion is usually aroused by the square shape of the lesion and its lineal character. Cantharides plaster is often used to produce the condition.

(3) *Soft Sore.*—This is usually situated on the dorsal part of the sulcus and is often multiple with corresponding ulcers on the inner surface of the prepuce. In one case the material used to produce the condition was a mixture of soap, and other mercuric or mercurous chloride (on analysis it was not clear which salt was used). In another case the patient was found to have a pot full of vaseline. This he said was for use in cleaning his accoutrements. He was sent back to the front as the lesion was thought to be most probably self-induced. A little later, owing to its being required the patient applied and under it an layer of vaseline there was found a greyish tenacious ointment which on application to a patient gave rise to soft sores within twenty-four hours. The material became less active later. On analysis this was found to contain soap, vaseline and mercuric chloride. The amount of Hg estimated as mercuric chloride was 5·31 per cent. The loss of activity was probably due to the formation of a little salt of mercury. Dermal has seen similar sores produced with plaster used for protection against the ill-smelling 1·5 per cent. of sodium silico-fluoride. The differential diagnosis between soft sore depends on (a) the mildness of the reaction of the edge of the ulcer, (b) the more thinness nature of the surface and its pin-point appearance. Absence of streptococci is also a guide.

(4) *Ulcerated Hard Sore.*—This artefact is the most difficult to recognize and is very frequently produced. They are mostly on the dorsum of the sulcus coronarius; they are also seen on the body of the penis and in the pre-scrotal angle. The ulcer resembles a hard sore very closely. In several cases, on searching the patient, a corrosive substance was found with which it was possible to reproduce a similar sore. Either a small bottle with a milk white fluid or a small metal box containing a deep white powder was found. On analysis one box of the latter was found to contain NaOH, Na_2CO and NaCl. The caustic

[illegible]

[illegible]

[illegible] of the [illegible] on the [illegible]

[illegible] plaster [illegible] the [illegible] suffered [illegible]

[illegible]

[illegible] of the [illegible] In [illegible] called [illegible] was sent [illegible] Within [illegible] legs and [illegible] again [illegible] for four [illegible] to [illegible] for [illegible] right leg. He [illegible] the front which [illegible]

[illegible] of the left hand [illegible] the size of [illegible] the [illegible] level. The [illegible] deeply [illegible] scars [illegible] recent [illegible] very closely. One [illegible] angular outline [illegible] side [illegible] What [illegible] the mucous [illegible] material was not found [illegible] too [illegible] place [illegible]

[illegible]

AMOSS (H. L.). The Cultivation and Immunological Reactions of the Globoid Bodies in Poliomyelitis. *Journ. Exper. Med.* [illegible] 1917, vol. xxv, No. [illegible], pp. [illegible]

The [illegible] described by Flexner and Noguchi [illegible] readily [illegible] The [illegible] becoming less [illegible] An [illegible] to [illegible] the [illegible] bodies [illegible] and [illegible] when [illegible] injected into [illegible] are [illegible] shows even [illegible] in tests [illegible] function with [illegible] had [illegible] tested [illegible] prepared [illegible] from the [illegible] disease. The author [illegible] globoid bodies and [illegible] *pull* [illegible] immunological [illegible] properties. [illegible] streptococci are frequently found [illegible] from the spinal cord or [illegible] the filtered virus. From a number of experiments [illegible] find any etiological or pathological relationship between these streptococci and epidemic poliomyelitis [illegible] poliomyelitis in monkeys.

J. W. B. S.

FLEXNER (S.) and AMOSS (H. L.). The Passage of Neutralizing Substances from the Blood into the Cerebro-spinal Fluid in Poliomyelitis. *Journ. Exper. Med.* April 1917, vol. xxv, No. 4, pp. 499–506.

It is stated that recovery in poliomyelitis and other infectious diseases is brought about by a process of active immunization, these immunity substances having been detected by neutralization and protective tests but not by other biological methods. There is evidence to show that these substances are not dependent upon the intensity of the clinical symptoms, but appear in the blood serum as early as the sixth day of the disease. By a series of experiments they show that when once the neutralizing substances are contained in the blood they can be made to pass into the cerebro-spinal fluid by inducing an aseptic meningitis through the injection of horse serum into the cerebro-spinal membranes, and this passage of the neutralizing substances in passively immunized monkeys takes place apparently only while the inflammatory reaction produced by the horse serum is at its height. The intraspinal injection of immune serum in poliomyelitis is [illegible] and it is probable that the only good which would be produced in man by the injection of normal serum would be due to the escape of the circulating immunity substances made possible by the aseptic inflammation set up [illegible] the meninges.

and [illegible] the immunity [illegible] by [illegible] blood [illegible] days (six) the early employment of normal [illegible] that of immune serum is urgently required

P W B S

FLEXNER (S) and AMOSS (H L) The Relation of the Meninges and Choroid Plexus to Poliomyelitis Infection [illegible] Med April 1 1917, vol xxv, No 1 pp 525 537

It is known that the presence of the micro organism or virus of poliomyelitis upon the mucous membrane of the nose and throat does not necessarily lead to infection but gives rise to a number of healthy "carriers" and as in cerebro spinal meningitis these are more numerous than actual cases of the disease There must therefore exist some special mechanism to protect the contaminated persons from the action of the virus which they carry The authors in the paper give the result of much work by themselves and others to elucidate this problem

The virus having reached the upper respiratory mucosa may take one of two routes to the central nervous system (1) through the local blood vessels it may be carried into the general circulatory system and to the nerve centres, or (2) it may pass through into the lymphatic vessels surrounding the olfactory nerves and ascend more directly to the brain and cord Experimental evidence has indicated that the latter is the most likely course as monkeys are easily infected by way of the nasal mucosa but with great difficulty through the blood When the virus enters freely from the nasal mucosa, the brain, the medulla and lastly the spinal cord become affected that is the virus enters by way of the olfactory nerves permeates the nervous tissue continuously and is not distributed by the general circulation It is the function of the choroid plexus and pia lymphatics to exclude the virus present in the blood from the nervous tissues, and if these protective structures are injured [illegible] can be made to follow Flexner and Amoss have shown that [illegible] substances will give rise to a transient aseptic meningitis which [illegible] the obstacle interposed by these structures and also to a less [illegible] that prevents infection by the virus present in the nasal mucosa [illegible] monkey or horse serum isotonic salt solution when injected [illegible] the meninges promote infection when the virus of poliomyelitis is introduced into the blood the nose or subcutaneous tissues Simple [illegible] puncture and withdrawal and replacement of cerebro spinal fluid does not do so but replacement of the cerebro spinal fluid of one monkey with that of another or any slight haemorrhage at the time of operation promotes infection

Of all irritant fluids tested immune serum alone when injected into the meninges is not followed by infection from a virus introduced into the blood and this is able to overcome the promoting action of normal monkey [illegible] serum and other irritants As a defensive factor Amoss and Taylor have shown that the secretions of the nasal mucous membrane in [illegible] persons and intermittently in others capable of neutralizing or inactivating the virus, and this destructive power may be looked on as a means by which the number of persons becoming contaminated with the virus is diminished during an epidemic and is also a mechanism for preventing actual infection among the carriers themselves

P W B S

AMOSS (H. L.) AND CHESNEY (A. M.). A Report on the Serum Treatment of twenty-six Cases of Epidemic Poliomyelitis. (*Abstr. Paper.*) April, 1917, vol. xxv, No. 4, pp. 581-608, with 3 charts.

During the epidemic of 1916 in New York State the authors treated twenty-six cases of acute poliomyelitis with human serum from recovered and convalescent cases of the disease. The death rate of the epidemic was high, but it is noted that examples suggesting streptococcic infection were not observed. The use of early lumbar puncture in all cases is most important for diagnostic purposes, as the chemical and cytological examination of the fluid should be made at once by the laboratory and treatment commenced immediately.

It has been shown that owing to the change induced in the cerebro-meningitis which precedes the paralysis there is an increased permeability of the vessels in the pia-arachnoid; this renders the reception of the immune serum into the blood an important though not the most direct route into the perivascular and perineural spaces in the spinal cord. The three important points to remember are: (1) Early and prompt diagnosis and treatment. (2) Intraspinal injection of immune serum. (3) Injection of immune serum directly or indirectly into the blood. It is possible to inject larger doses of the serum by the blood than can be given intraspinally and as 50 c.c. are often required this is important. The serum used should contain as much inert substance as possible and should therefore be taken from recent convalescents. The serum is always carefully tested for sterility and by Wassermann's reaction, and it must not contain any blood cells. Inactivating the serum by heating to 56° C. or by addition of 0·2 per cent. of tricresol does not reduce the protective power. The intraspinal and blood injections are given at the same time and when certain precautions cause no dangerous symptoms. The serum should be given within forty-eight hours if possible and the best results are obtained in cases treated within thirty hours and at least 30 c.c. should be injected.

The cases were divided into two groups: (1) twelve showed paralysis at the time the serum was given; of these one died ten hours after, two there was a slight extension of the paralysis, and in nine the disease was arrested. (2) fourteen cases in which there was no evidence of paralysis when the serum was given. Two died due to respiratory paralysis, two developed slight paralysis, and ten or seventy-one per cent. showed no paralysis.

In acute poliomyelitis, even more than in acute meningitis, the substance of the spinal cord and medulla suffer injury from perivascular infiltration; therefore the ill effects of increased intracranial pressure are more marked. The curative serum should therefore be injected under low pressure and allow the withdrawal of a greater quantity of cerebro-spinal fluid than that of the serum injected. If a small quantity can only be given intraspinally a larger amount should be given intravenously.

The action of the serum is more definite in preventing paralysis than in reducing this when present; hence the importance of early treatment.

In the cases recorded the inoculations were only made on one day, and it is still an open question whether if these had been repeated the results would not have been better, but so far it is evident that in man the serum has a definite beneficial effect and this is consistent with the experimental evidence obtained with monkeys. P. W. B. S.

Murray (W. H.) [illegible] 1917, vol [illegible]

Many [illegible] including the [illegible] author's experience [illegible] to the patient [illegible] he shall [illegible] He states that [illegible] patient lives five days [illegible] of quinine as a [illegible]

Through [illegible] of the disease [illegible] difficult to [illegible] diagnosis has been [illegible] and [illegible] day or in [illegible] for twenty [illegible] weeks of normal [illegible] and the [illegible] the drug cannot [illegible] by the mouth [illegible] of chlorohydro[illegible] a quart of [illegible] The intra[illegible] for the *first* [illegible] rapid that [illegible] dose [illegible] for the patient [illegible] long enough to cure the disease [illegible] practically [illegible] by the [illegible] through the [illegible] prophylaxis [illegible] satisfactory [illegible] to give three [illegible] at noon [illegible] at night and [illegible] the morning [illegible] Saturday and Sunday. He quotes an instance of fifty men [illegible] malarial [illegible] he had been given the usual 5 gr [illegible] they [illegible] 10 gr daily but six of the fifty [illegible] during the first [illegible] with an average sickness of five days [illegible] On the seventh day the above mentioned large doses were given [illegible] Since this method has been [illegible] the average sickness has been two days only per case. [illegible] prophylactic an occasional day of active treatment is more effective and [illegible] than the method of daily small doses.

P. W. B. S.

Mullins (A. D.)—The Intravenous Administration of Concentrated Solution of Quinine in Malaria and Haemoglobinuric Fever. *United States Naval Med. Bull.* April 1918, vol. xii, No. 2, pp. 135-141.

The observations were made at Haiti during an epidemic of malaria and blackwater fever in 1918. The malarial cases were mostly due to [illegible] parasite and those of six blackwater ones were acute. Four hundred cases were treated with concentrated injections of quinine [illegible] without causing a single unfavourable reaction in [illegible] cases and with excellent results in the blackwater ones [illegible] infusions were used in conjunction to counteract [illegible] or increased urine elimination.

[illegible] concentrated solution [illegible] gr of soluble chlorosulphate was [illegible] 1 mil (1 c.c.) of sterile water and 10 gr in 10 mils were [illegible] each dose. The immediate effect was a slight burning sensa[illegible]

tion in the throat rapidly followed by a [illegible] cough [illegible] which quickly passes to all parts of the lo[illegible] They [illegible] for about five minutes, after which the patie[illegible] effects are experienced nausea is rare [illegible] tions daily for four or five days then once [illegible] they are considered cured Iron and arsenic [illegible] useful With this treatment there was no pa[illegible] not a single relapse occurred The intolerance [illegible] method is far preferable both in its immediate [illegible] injection of more dilute solutions (1[illegible] he states that intramuscular injections are slow [illegible] causing much pain locally and sometimes ab[illegible] concentrated solutions given intravenously [illegible] and terminated the patient saved [illegible] there is great saving of time in [illegible]

(The bad results follow[illegible] intramuscular [illegible] Sir R Ross has not found intravenous is [illegible] tration and it is also not devoid of dange[illegible]

GAUTHIER (A) Sur le traitement de l'syphi[illegible] l'arsenic organometallique [illegible] Paris 1917 3 ser tome lx [illegible] pp 513 517

The combined treatment by organic [illegible] methylarsenate of sodium (arrhenol) and [illegible] (5 gr) cure the most obstinate cases of [illegible] taken by the mouth or injected separately [illegible] cutaneous tissues without giving rise to the pain [illegible] hemoglobinuria and anuria [illegible] sometimes induced by subcutaneous injection of [illegible] To insure success the treatment should be [illegible] and quinine get into the blood six or seve[illegible] paroxysm is expected In pernicious malaria [illegible] Le [illegible] As is well known the organic salts [illegible] the therapeutic effects of mercury in syphi[illegible]

LEMAIRE (G) Le syndrome "Mal de [illegible] Paris 1918 tome xxiv, pp 65 67

In the upward flight the symptoms [illegible] of ascent include headache noises in the ears [illegible] and small pulse Estimations taken by Tuch[illegible] show that the systolic blood pressure rises slightly from the [illegible] metres after which it remains rather higher than in the earl[illegible] diastolic pressure falls at first rapidly then more slowly During descent the headache disappears at an elevation below that at which it appeared After an initial acceleration of the rate of the pulse steadily slows especially when the descent is not rapid [illegible] systolic blood pressure falls and the diastolic rises After [illegible] noises in the ears persist for a time depending on the [illegible] previous proximity to the motor and is forgotten [illegible] ment shown by exhilaration slight tremor of the [illegible] of the face and conjunctiva The systolic blood p[illegible]

[illegible] the diseases [illegible] higher than [illegible] asc[illegible] [illegible] suggests that cerebral [illegible] is due to low [illegible] blood pressure and cardio vascular fatigue, [illegible] that the influence of [illegible] atmospheric pressure on the nasal [illegible] accounts for the drowsiness, faintness and giddiness experienced by some [illegible]

H D R

[illegible] (M) Traitement des porteurs de meningocoques par le serum [illegible] meningococcique desséché *Bull et mém Soc méd des h p de Paris* 1917 3 ser tome xli, pp 693-4

[illegible] meningococcic carriers were treated by insufflations nightly and [illegible] of dried intrameningococcic serum from the Pasteur Institute by [illegible] special apparatus provided by the Institute for the treatment [illegible] carriers The results are encouraging in twenty three out [illegible] carriers the meningococcus disappeared between the third [illegible] day The treatment is not painful or irritating but some of the [illegible] had slight headache for an hour after the insufflation

H D R

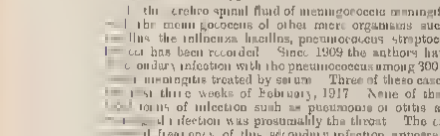
[illegible] (A) and Salaiter (M) Apparition des pneumocoques dans le [illegible] les méningites cérébrospinales en cours de traitement Explica[illegible] de cet envahissement Emploi prophylactique de serum anti[illegible] ococcique *Bull et mém Soc méd des hôp de Paris* 1917, [illegible] tome xli pp 394 399

[illegible] the cerebro spinal fluid of meningococcic meningitis the association [illegible] the meningococcus of other micro organisms such as the tubercle [illegible] the influenza bacillus, pneumococcus streptococci and staphylococci has been recorded Since 1909 the authors have seen four cases [illegible] condary infection with the pneumococcus among 300 cases of meningo[illegible] meningitis treated by serum Three of these cases occurred during [illegible] first three weeks of February, 1917 None of these cases had any [illegible] tions of infection such as pneumonia or otitis and the source of [illegible] infection was presumably the throat The explanation of the [illegible] frequency of this secondary infection appears to be a coutem[illegible] increase in virulence of the pneumococcus as shown by the [illegible] prevalence of pure pneumococcic meningitis since December [illegible] In order to prevent this grave secondary infection in cerebrospinal [illegible] the authors advocate the addition to the antimeningococcic serum of [illegible] of a very active antipneumococcic serum prepared by Truche [illegible] Institute

H D R

[illegible] FROM THE LABORATORIES OF THE ROYAL INSTITUTE OF PUBLIC HEALTH [illegible] — DIAL CIBA *Journal of State Medicine*, vol xxv [illegible] July 1917, pp 221 222

[illegible] which has been introduced by the Saccharin Corporation [illegible] photic consists of colourless, odourless crystals with a [illegible] taste freely soluble in warm water alcohol and ether and [illegible] melting point of 170 to 171 C The formula of dial is $C_6H_1N_2O_3$, [illegible] structurally as —



[illegible] allyl-urea [illegible] Dr Coeg[illegible] to the group of almost hypnotics [illegible] to 3 gr (0·2 to 0·2 gm) It differs [illegible] urine and type in that no traces of [illegible] can be found in the urine and derivative [illegible] the hypnotic function In the case of bromalin barbiturate [illegible] 80 per cent can be recovered from the urine Dial [illegible] up and [illegible] integration going on even to urea the [illegible] molecule splitting up into carbonic acid and water

The drug has no irritant action on the [illegible] intestinal tract or kidneys whilst it reduces the blood-pressure [illegible] indication that the maximum dose of 1 gr should not be [illegible] patients whose circulatory system is affected and whose blood pressure is below normal It has no residual effects such as lassitude [illegible] and it would appear that habituation is not acquired [illegible] effect is manifested Dial is indicated in simple insomnia hysteria neurasthenia dipsomania morphinism dementia etc Dr M [illegible] and A [illegible] report (*Bulletin médical* 1917, No 2 p 12) that it has a rapid and durable action is quite safe and free from any unpleasant after effects while Sir George Savage has found it beneficial in shock and senile insomnia and confirms the experience that its use is attended with no evil after effects

VIGUIER COUTOUNS et JEAN Contribution [illegible] de la Chirurgie de Guerre' d après les Observations de Blessés du C E O [illegible] l Hôpital maritime permanent de Sidi Abdallah (1914 1916) [illegible] *de Méd et Pharm mil*, Paris, 1917 tome cxl pp 90 91 161 173 291 273

ARTERIAL WOUNDS BY PROJECTILES

Only twenty five wounded showed isolated lesions of the vessels Wounds of veins and arteries therefore represent hardly 1 per cent of the war wounds we have observed in our wards this is explained by the great mortality from hæmorrhage caused by these wounds on the battle field itself, or in the ambulances at every first line The wounded who reached the hospital had either the arteries tied, or arterio venous aneurysms slowly developed We were obliged to amputate in four wounded who in consequence of ligatures of important arterial trunks showed humid vascular gangrene A little patient who had had the right subclavian artery tied died of overwhelming secondary hæmorrhage shortly after his arrival at the hospital The others recovered normally

We observed nine cases of arterio venous aneurysms divided into five pulsatile arterio venous hæmatomata four arterio venous varicose aneurysms

Symptoms and Diagnosis — Amongst all our wounded symptoms of arterio venous aneurysm were complete more or less voluminous regular tumour more or less reducible, with pulsation, expansion systolic thrill and bruit carried to a distance oedema and diminution of the pulse below the lesion pains more or less violent and shooting In one

[1] See this Journal vol iii No 3 pp 377 390 and *Arch de Méd et Pharm mil* pp 5 25 81 89

patient in [illegible] observed the weakness of the pulse of the injured side at the root of the limb referred to in August, 1915 by M. le médecin central Coutant.

We have noted in nearly all our patients that perforating wounds [illegible] with a single orifice, were nearly cicatrized on their arrival in our hospital.

Pulsatile hematomata are distinguished from sacciform aneurysms by the absence of thrill, by their slight expansion and above all by the ecchymosis and infiltration which they cause.

Clinical diagnosis of these vascular lesions is generally easy. The anatomical diagnosis of the injured part is more difficult. It is almost impossible to detect it within 1 cm. the seat of the rupture of vessels [illegible] to the dilated hematoma. The seat of the swelling is [illegible] very far from the injured point, the blood having effused little by little following the muscular planes. For example in one case the [illegible] was in the centre of the thigh while the vascular [illegible] was the centre of Scarpa's triangle, the space between the [illegible] indicates sacciform aneurysms localization [illegible] exact.

Vascular Suturing

We have only dissected many vessels of the lower limbs [illegible]

	Hematomata	Aneurysms
Femoral vessels	1	2
Popliteal vessels	1	1
Tibial [illegible] of the limbs	2	—
[illegible] vessels	1	1
	9	1

[illegible] due to projectiles of small calibre.

[illegible] shrapnel one, and a fragment of bomb from [illegible]

[illegible] caused by fragments of shell are most often serious on [illegible] the extended section of vessels and muscular lacerations or [illegible] accompanied by fractures necessitating amputation in the [illegible]

[illegible] anatomical point of view, we have not observed a purely [illegible] aneurysm. Amongst all our patients artery and vein had been [illegible] injured; pulsatile hematomata or arterio venous sacciform [illegible] thrill therefrom.

[illegible] hematomata the anatomical lesions consisted of sections [illegible] or less extended, reaching to 2 cm. The muscles [illegible] and lacerated by clots of blood. The smallness of the [illegible] allowed the clots to compress or even to block up the vessels, [illegible] hemorrhage.

[illegible] sacciform aneurysms, the sac more or less [illegible] entrapped the veins. In one case there was a [illegible] fractured fibula with rarefying osteitis of this [illegible] patient we observed an anomaly of the vessels [illegible] fibula's posterior muscle and not above. The opening [illegible] somewhat big about 1 cm. The sac had nearly

[illegible] with the [illegible] indicated the extirpation. The seat of [illegible] coincide with the point of penetration [illegible] wounds the lesion was often seated [illegible] projectile which is explained by the deflection [illegible] in the course of its passage through the limb.

Operating Technique

The operations were nearly always long (on average of [illegible] times two hours). Laborious necessitating big incisions. The [illegible] had at times to be extended the summit of the swelling not corresponding to the seat of the lesions. We used as often as possible an [illegible] the proximal end of the limb and an Esmarch band beneath the [illegible] limit the loss of blood. In some cases of femoral aneurysms [illegible] high we were obliged to confine ourselves to simple digital compression and once we had to expose the external iliac to guard against eventuality. In three cases the operation was difficult with [illegible] hemorrhage requiring much *sangfroid* and decision from the [illegible] Notwithstanding ligatures of the laterals adjacent to the [illegible] emerging from the sac on the removal of the tourniquet [illegible] hemorrhage nearly always broke out. It was necessary to replace the [illegible] quet and to make supplementary ligatures.

As regards pulsatile hematomata where there is a partial [illegible] the vessels, two methods compete. —

Souligoux and other surgeons advocate ligature of the [illegible] Pauchet is in favour of angiorrhaphy. Theoretically the [illegible] vessels is more logical it insures the preservation of the [illegible] from later complications but it is very often inefficacious in [illegible] vessels of medium calibre it narrows the lumen of the vessel [illegible] We preferred double ligature above and below the seat of the lesion [illegible] rupture of the femoral vessels where we wished to practise [illegible] the lesions were too extended (loss of substance of 2 cm in one case) we had to confine ourselves to ligature. Notwithstanding [illegible] leave the deep femoral artery free from ligatures we were obliged [illegible] above it in one case.

The following should be noted. The difficulty of [illegible] the lesion at once the somewhat precise sanguineous [illegible] spite of the tourniquet, and necessitating rather long, plus [illegible] compression, in order to guard against the extension of the [illegible]

As regards saccifom aneurysms three methods are [illegible] favour double ligature of the vessels above and below [illegible] quadruple ligature with extirpation of the sac and the [illegible] of Matas. This last method has given remarkable results to [illegible] surgeon Soubbotitch judging of it by his statistics [illegible] Society March 22 1916. It tempted us but we did not dare to [illegible] it after having noticed how easily the operation wounds of [illegible] were inflicted. We adhered to quadruple ligatures followed by [illegible] extirpation of the sac as advised by many French surgeons. In one case we were obliged to confine ourselves to quadruple ligature followed by ligature *en echelon* the whole length of the sac on account of secondary hemorrhage in the course of the operation. The dissection of the

[illegible] is always [illegible] the adhesions are frequent either to the muscles or to the [illegible] or to the posterior tibial nerve). We have always practised [illegible] drainage of the wounds and we even consider it indispensable.

As post operative treat[illegible] we [illegible] a well glued splint and lomentation injections of serum and [illegible] in big doses.

Pr[illegible] Intervention

Intervention should take place somewhat quickly in pulsatile hematomata on account of the anemia. We operated on an average two to [illegible] days after their arrival at the hospital. Those with tumefaction were operated on two or three days after their arrival. In other cases, where one had apparently to deal with secondary diffused hematomata, the operation was only made when the symptoms had become apparent. As regards sacciform aneurysms the moment favourable for the operation appears to be two or three weeks after the wound. By then the collateral circulation has had time to more or less recover. Most of our operations were performed at this interval except in one patient, when for reasons beyond our control we were only able to operate two months after the date of the wound. The dissection of the sac was then difficult. Our opinion is that in the case of these aneurysms the operation should be done as soon as possible. The question of the restoration of the collateral circulation does not appear to us primordial.

If the aneurysm is favourably situated that is to say if it is not near the origin of the profunda femoris in regard to the femoral artery, if in the lower region it is not in proximity to the popliteal artery, the collateral circulation will more often recover after the operation. In operating at the earliest possible time the tumour will have no adhesions, will be smaller, infection will be less likely to occur and one can perhaps more easily effect a complete restoration of the lesion that is to say, by the aneurysmorraphy of Matas.

Complications—Post operative Complications are frequent.

(1) *Infection.*—We will not say that infection is the rule, but it is frequent—above all in cases of pulsatile hematomata, where the diffusion of blood in the muscles forms a centre of propagation for certain microbes carried by the projectile. In spite of all our aseptic precautions we had [illegible] more or less profuse suppuration after our operations for arteriovenous aneurysms, when at the same time we did several abdominal operations without having infection. Notwithstanding the drainage, infection of the wound occurred necessitating the release of all the stitches. In one case there was even extensive diffusion of the infection and suppurative arthritis of the knee.

(2) *Vascular Gangrene.*—This is another frequent complication of the treatment of aneurysms, above all when one has tied above the deep femoral artery or in the lower part of the popliteal. We have observed dry vascular gangrene slowly developed and limited to the foot and leg and these cases of humid vascular gangrene rapidly developed.

(3) Fatal pulmonary embolism supervened in one of our patients who [illegible] a humid vascular gangrene.

(4) Pneumonia caused us to lose a patient on whom we had been

obliged to amputate the thigh on account of humid vascular gangrene. Death supervened [illegible] days after the amputation.

(5) Delay in cicatrization of operation wounds, which apparently should have healed normally, were frequent in our patients.

We observed the delay of cicatrization in one of our patients who reached our wards September 22, 1915. He had been operated on September 4, 1915, on a round nasal hospital slip for diffused aneurysm of the femoral at the middle third. On December 14 the operation wound, which was 2 cm. still showed in its centre an atonic surface of 10 cm. which necessitated scarification. The patient was only able to leave cured on January 27, 1916, walking normally and without circulatory trouble. These delays for the most part are due to infection but also to the disorders of the circulation in the limb, which follow ligatures.

(6) Muscular retractions were observed in two of our patients. They necessitated forcible stretching and mechano therapeutic treatment. They are the result of lesions caused to the muscles by sanguineous infiltration, and the extensive incisions or muscular dissociations necessitated by operations.

Results

Two of our patients died, the one from embolism, the other from pneumonia, having had vascular gangrene in the lower limb following ligature of the femoral vessels, giving a mortality of 22 per cent.

We had to perform three consecutive amputations—one of the leg on account of dry gangrene and two of the thigh for humid vascular gangrene. Two of these patients recovered.

One of our patients recovered after grave septic complications with ankylosis of the knee.

We had two other patients who had shown muscular troubles, and were only cured after mechano therapeutic treatment.

Only two recovered rapidly without any complication and showed no trouble in walking or of the circulation.

We sum up our results in the following tables:—

I.—Vessels injured and the Nature of the Injury.

	Traumatic hematoma	Sac for aneurysm	Total
Femoral	2	2	4
Popliteal	—	1	1
Peroneal	2	—	2
Posterior tibial	1	1	2
	5	4	9

II.—Arterio venous Aneurysms treated by Ligature.

		Cured	Congested	Dead
Femoral	3	—	3	1
Peroneal	2	2		
Posterior tibial	1	1	—	—
	6	3	3	1

[illegible]

Femoral	[illegible]	[illegible]		
Popliteal	[illegible]		[illegible]	—
Posterior tibial	[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]	

[illegible]

(1) Pulsatile hæmatoma of the femoral vessels Quadruple ligature	Dry gangrene foot [illegible] tation of leg [illegible]
(2) Pulsatile hæmatoma of the femoral vessels Quadruple ligature	Humid vascular gangrene rising above the popliteal space Amputation of thigh at the upper third Death from pneumonia
[illegible] Sacciform aneurysm of the femoral vessels Quadruple ligature	Humid gangrene Death from embolism before the operation
[illegible] Sacciform aneurysm lower popliteal Ligature and extirpation of the sac	Humid gangrene Amputation of thigh at the lower third Cure

Conclusions

1) Arterio venous aneurysms diffused or sacciform of the lower [illegible] caused by bullets are grave lesions from the fact alone of the [illegible] lesion and from post operation complications which they entail [illegible] post operation gangrene is frequent above all in lesions of the femoral [illegible] popliteal vessels Post operation mortality is somewhat high [illegible]

[illegible] intervention should be quick In our opinion it is emergency [illegible] any suspected wound which has provoked a sufficiently pro[illegible] hæmorrhage should lead to a systematic exploration of the [illegible] in the zone in the neighbourhood of the wound, similarly as one [illegible] systematically explores wounds of the skull

3) The operation is serious difficult and full of the unforeseen An [illegible] incision must be made and often it is even necessary to enlarge [illegible] incision in the course of the operation In pulsatile hæmatomata the [illegible] plan to discover the lesion with certainty is to follow the vessels from one extremity of the wound to the other without deadling

(4) According to published works, angiorraphy in cases of pulsatile hæmatomata and aneurysmorraphy for sacciform aneurysms are the methods chosen and give recoveries without incidents But these operations are often impracticable on account of the extent of the lesions and in a large number of cases one must confine oneself to ligature above and below the lesions with or without extirpation of the sac The extirpation of the sac should always be preceded by ligature of the collaterals issuing from the sac

Fractures of Limbs by Firearms

Fractures of limbs by firearms represent about 20 per cent of the war wounds observed in our wards. We treated 374 of these fractures divided as follows:—

Type. Limb

Clavicle and scapula (without loss of the clavicle)	1
Anterior fracture of the shoulder	
Fractures of the humerus	1
Olecranon fracture of the ulna	1
Fracture of the forearm: Of the radius	1
Of the bones	1
Fractures of the lower extremity of the radius without loss of substance	1
Fracture of both bones of the leg	1
Fracture of the upper part of the femur	1
Fracture of the lower part of the femur	1
Total	1

Fracture

[illegible]	
[illegible]	
[illegible]	[illegible]
[illegible] of the femur	
[illegible] of the femur: Of two bones	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Total	[illegible]

These fractures were caused by gun shot or shrapnel. In regard to shell or bomb explosion of mines. In May and June 1916 the fractures by gun shot were the most numerous as our troops in the Dardanelles had a period were defending many attacks. From the month of July fractures by fragments of shell or bomb predominated.

Pathological Anatomy

Every type of fracture is shown. In half the cases it was only question of grooved injuries of perforations incomplete or complete without any tearing apart of structures, lesions caused by projectiles fired from a great distance. In the other half there were complete fractures with displacement more or less pronounced, with multiple splinters of bone projected into the neighbouring tissues sometimes even complete crushings necessitating immediate amputation on arrival in our wards. In three cases of fracture of the thigh we clearly recognized Delorme butterfly wings fracture.

Clinical Study

In most cases the diagnosis of fracture is obvious. In certain fractures with surface grooving or with superficial perforation radiography alone furnishes the diagnosis. Radiography also enabled us to

[illegible] extent the lesions above all in [illegible] fractures We [illegible] ays able to radiograph our patients [illegible] the first days on [illegible] the difficulties of transport to the [illegible] ward and also as [illegible] months one of us had to take charge of both the surgical [illegible] graphs at the same time Two thirds of these [illegible] infected they suppurated, the muscles were dilacerated [illegible] sometimes the general condition was affected Non [illegible] fractures even in cases of double perforation, progressed as simple fractures

Complications

Vascular lesions were rare Six patients with fractures reached us with muscular gangrene —

Lesions of the brachial vessels 2 vessels of the fore arm 1, palmar [illegible] 1 femoral vessels 1 and posterior tibial vessels 1

In one case of fracture of the thigh a secondary rupture of the femoral [illegible] occurred which in spite of a ligature immediately made, caused the death of the patient We had as nerve complications two com[illegible] of the radial nerve caused by callus of the humerus a complete [illegible] of the median nerve at the wrist and a partial obstruction of the [illegible] in the fore arm Gas gangrene appeared in ten of our [illegible] In four cases there was gangrene of the whole limb with bad [illegible] condition Amputation was necessary In our six other cases [illegible] were in the nature of a gaseous phlegmon with phlyctenæ and [illegible] discoloration limited to the fractured segment The limb was [illegible] Tetanus only supervened in a few of our cases of fractures added [illegible] these were encountered with the disease in evolution Erysipelas [illegible] appeared in any case of fracture

Acute osteomyelitis appeared in the greater number of our cases when [illegible] of the fracture was infected In spite even of drainage incisions [illegible] septicæmic conditions developed in about fifteen of [illegible] particularly in cases of fracture of the thigh, of the shoulder [illegible] hip Chronic osteomyelitis followed on acute osteomyelitis [illegible] when the patients appeared to have recovered [illegible] Sinuses were obstinate, and radiography disclosed [illegible] zone of clear tissue in the centre of a bone appearing [illegible]

Evolution

[illegible] fractures of the diaphysis or of the epiphysis recovered [illegible] fractures even when the osseous damage was some[illegible] Consolidation was effected in a month or two [illegible] the bone fractured Of the infected fractures a certain [illegible] rapidly enough with or without intervention but most [illegible] a treatment of six to ten months particularly [illegible] the thigh and the leg Many of our cases we [illegible] follow up to the end (about 170) the requirements of the [illegible] stated their evacuation to the hospitals of Tunis or of [illegible] their condition permitted the journey

Results

[illegible] *Cause of Death* —Death supervened in 4 per cent of the [illegible] Seventeen of our patients with fractures succumbed before or

after inte[illegible] Articular fractures of the shoulder and of [illegible] fractures [illegible] of the humerus gave the maximum [illegible] The [illegible] were divided as follows Septicæmia and pyæmia [illegible] gangrene [illegible] throbbing hæmorrhage [illegible] and concomitant [illegible] of the chest and pleuro-pneumothorax [illegible]

Infected [illegible]—One hundred and thirty eight wounded left the hospital cured that is [illegible] per cent

Amputations and Deaths and Mutilation—Forty six wounded have been invalided out following on ankylosis or losses of limb say about 14 per cent

Examined—One hundred and seventy three patients that is 47 per cent

Treatment

Non infected Fractures—Their treatment was confined to sterile dressings and when there was displacement to immobilization in hæmostatic plaster appliances Hence equipment appliances for the humerus and Delbet's walking appliance for the leg gave good results

As regards fractures of the thigh we have nothing but praise for Duverney's appliance with continuous extension by means of adhesive bands strips of diachylon could not be used on account of the heat (Appliance of Duverney see *Paris médical* June 19, 1915)

Infected Fractures

(*a*) *Interventions of Emergency*—Cleansing and drainage of all infected fractures were systematically practised We were obliged to intervene immediately in ninety six cases We were conservative in the extreme even in articular wounds confining ourselves to removing the splinters of bone As regards diaphysial fractures we performed thirty seven operations for removal of splinters of bone invariably followed by ample drainage and as regards articular fractures twenty five arthrotomies and resections Most often we then made atypic resections consisting in the extirpation of free epiphysial splinters On the knee staple arthrotomy with two juxta-patellar incisions on anti-septic principle gave us good results in cases where there was but a slight hæmarthrosis

We only performed thirty four amputations and disarticulations of which fifteen were on the phalanges or the metacarpals We amputated immediately on arrival only in cases of gangrene or of too extensive crushing In all these cases we amputated as near as possible to the lesions practising the circular system of amputation with one or two lateral incisions and leaving the stumps uncovered to which we applied compresses soaked in ether

In eight of our wounded amputations was secondary a need [illegible] month after their arrival, a septic condition which they were unable to overcome having originated at the site of their infected fractures In these cases of secondary amputation we practised classic amputations but without suturing We confined ourselves to maintaining the flaps joined above a compress, by two knotted bronze threads which were undone at each dressing This technique indicated to us by Dr Oudard enabled us to avoid the frequent secondary infections of the stumps which we had observed several times in cases of amputation evacuated

ARTHROTOMIES AND RESECTIONS FOR ARTICULAR FRACTURES

Injured part	Nature of the intervention: Acute	Results: Recent	Results: Atypical	Total	Complications	Results: Excellent	Results: Recovered with slight stiffness	Results: Slight shortening or bony deformity	Death	Causes of death
Upper limb										
Shoulder	1	1	1		1 disarticulation	1	1	1		Septicæmia
[illegible]			4	6		3	1			
[illegible]			4	4				2		
[illegible]		1		1			1			
Total	1	1	1	12	1	8	3	3		
Lower limb										
[illegible]	2		1				1		1	Septicæmia
[illegible]			3	1				2	1	Septicæmia
[illegible]			3		1 (low upper third)	2		1		
[illegible]		1		1	1 (lower middle third)				1	Septicæmia
Total	6	1	8	1			1	1	1	
General total			17	11	3	10	6	7	3	

from various ships and which necessitated opening up and [illegible] drainage

We append here two recapitulatory tables one in regard to amputations and for arthrotomies and resections with their results This latter table comprises later resections for certain fistulous articular fractures of which we shall speak further on

Apropos of these interventions of emergency we draw attention to the advantages of prolonged anæsthesia by chloride of ethyl it is not dreaded by the patient does not weaken him and causes no discomfort after the operation no risk is incurred and it lasts sufficiently long for small interventions such as the removal of splinters of bone and arthrotomy

(*b*) *Secondary Interventions*—These were chiefly the extensions of sequestra, scooping or hollowing necessitated by sinuses with persistent suppuration Twenty six of our wounded had to undergo these interventions some had even to be operated on two or three times new sequestra forming after each intervention

Certain articular fractures, which appeared to recover normally were the site of origin of interminable suppurations which developed without affecting the general condition, and of multiple sinuses In these cases we performed typic resections of which these were of the head of the humerus—one of the head of the radius in a case of fracture of the ulna with dislocation of the radial head, and one of the inter phalangeal articulation of the right index The results were perfect in the case of this last patient and in that of another with resected shoulder (head and 2 cm of surgical collar)

On two patients we sutured the patella, one of whom left cured the other, on the road to recovery had to be evacuated For a pseudarthrosis of the humerus at the middle third we made a suture after the method of Lejars The result was not good

The ample removal of bones attacked by later infection advocated by Surgeon Major de Vaucresson (*Archives de Médecine Militaire* January, 1916) gave us good results the treatment is long on account of the large surfaces to make good

Three of our wounded were operated on for nerve lesions following on fracture In two cases of inclusion of the radial nerve in callus of the humerus we effected the liberation one patient recovered all movements in the other case the nerve, being greatly injured movements had not reappeared by the time the patient was evacuated to Tunis It was the same in the case of our patient operated on for partial interruption of the median in the fore arm

Appliances

A certain number of wounded arrived in our wards already immobilized in plaster appliances In every case of infected fracture we used plaster appliances for immobilization Various grooved plaster splints and circular appliances of Calot were employed but in the greater number of cases we used appliances furnished with loops (*appareils à anses armées*) For fractures of the thigh we cannot speak too highly of the appliance of Munson (*Presse médicale* May 20 1916), which gives a very good reduction and is borne extremely well by the patient, which it allows to sit down or be carried from the room, which is an appreciable advantage For all articular fractures and for certain diaphysial fractures

with lag[illegible] is the app[illegible] Lance (*Paris* [illegible] 1915) gave excellent results. [illegible] flow of rodeo[illegible] continuous extension helped it [illegible] the application by [illegible] attached to the lower ring. The appliances are sufficiently [illegible] strong, they become thoroughly rigid provided that the [illegible] loops are allowed and joined together behind for fractures of the [illegible] part. Outer a band of hoop iron (3 or 4 mm. in width, respectively [illegible] plaster) being in contact with the limb. Our surgical store [illegible] depleted of appliances of Delbet for the thigh and arm until the [illegible] months ago we were able to experiment with those appliances for [illegible] fractures by breaking. A fortnight ago we had a splendid result in an case of simple fracture of the humerus.

Dressings

We made great use of antiseptics headed by permanganate of potash at 1 or 2 per cent., secondarily Labarraque's fluid, and carbolic acid at 2½ per cent. We washed the wounds freely and for fractures of the extremities we even gave prolonged baths of permanganate. We may have impeded the healing of the wounds, but it was necessary before all to arrest the growth of microbes. A number of the wounded having reached us with lateral wounds which had not been dressed for three or four days. We tried certain recommended antiseptics such as nitrate of silver, at 1/200,000 or other solutions; the wounds were too infected to allow of satisfactory results.

On the other hand, we have nothing but praise for Dakin's fluid. We continued to use it on certain patients on whom the method had already been practised in hospital ships. We installed it as either continuous or intermittent irrigation according to the degree of the infection on nearly all our patients, who had undergone amputation or otherwise had been operated on. We here note a combined method which gave us excellent results in certain very infected fractures. It consists in strongly disinfecting at the outset with permanganate of potash at 0·50 or 1 per 100 in continuous irrigation and then as soon as the suppuration diminished in installing continuous irrigation with Dakin's fluid. It prevents relapses and allows the work of restoration to proceed under antiseptic control. As regards dressings properly so called we preferred moist dressings with various antiseptics without oil silk. When the suppuration had dried up we placed in the wound for a few days gauze tampons soaked in ether alcohol. Mercurcrome fluid or Calot's fluid. We then passed on to aseptic dressings.

Heliotherapy

The sun's rays was of the greatest value. The balconies extremely well arranged in our wards enabled the wounded to benefit by this natural antiseptic. Exposure to the sun was gradual being augmented little by little each day. The patients were easily moved thanks to their plaster appliances. We practised early heliotherapy even on some feverish patients with suppuration. The results were good cicatrization was hardly rapid. The sun, it is true, did not always prevent the formation of sinuses but it certainly diminished the number, and it helped to shorten the stay in the hospital of many wounded.

A recapitulative table is here appended of all fractures with the results —

[illegible]

[illegible] Results Following Amputations [illegible] by the Limbs

We continued the treatment of thirty five wounded who [illegible] from severe fractures of the limbs with vascular or gangrenous [illegible] had undergone amputations of emergency either in the [illegible] or aboard hospital ships

These thirty five amputations were divided as follows Arm [illegible] thigh (of which one had both fore arms amputated) 3 wrist, 4 metacarpal 1 thumb, 2, various fingers, 3 thigh, 8 and leg 2

The majority of these patients recovered normally the wounds were not sutured or were simply repaired by two or three wire sutures but a certain number surviving with the wounds sutured and drained showed complications Gas gangrene continued to develop in five wounded who had undergone amputation on account of this infection Two patients with amputation of the arm died in spite of our intervention—one on the evening of his arrival the other on the following day A third with amputation at the middle third of the fore arm had to undergo an amputation of emergency at the middle region of the arm As regards the others conservative treatment proved efficacious It consisted in the first instance in removing all the stitches incising freely the whole circumference of the stump with a thermo cautery to making a circle of deep punctures with the actual cautery injecting pure oxygenated water limited to the gangrenous zone and in placing tampons of gauze soaked in ether in the musculo interstices and on the raw surface of the stump We added to this local treatment a general treatment with serum and camphorated oil in strong doses (1 to 10 c c) This treatment which we prescribed on all our patients with fractures who had been attacked by limited gas gangrene gave excellent results Two other patients had developed abscess in the sutured stump We opened up the parts and installed continuous irrigation of permanganate of potash Recovery was fairly rapid We excluded two defective amputation stumps after the conservative method of Pirolet

Prosthesis for the mutilated has not executed at Sidi Abdallah the patients were all fitted with appliances at the hospital Mulhouse Algeria

Tetanus

Cases of tetanus were rare amongst the wounded evacuated from the Front at the Dardanelles The majority had received the preventive injection of 10 c c immediately after being wounded The men who could not be injected on account of the congestion at the time of the attacks of April 28 and May 6, 1916 and who had been transported on ships or fitted as hospitals, were all given 10 c c of antitetanic serum on reaching our wards At first we only made a single injection of 10 c c but afterwards we applied the regular technique of Roux and Vallard that is to say, three successive injections of 10 c c of antitetanic serum at intervals of 1 week All soldiers evacuated from the Front on account of frostbite of the feet were systematically injected according to this technique moreover to the case of every intervention an difficulty arose and not a single case of tetanus occurred in our wards

The three cases of tetanus which we had to treat revealed us with symptoms already present the clinical aspect of each case differing There was one case of tetanus of late development limited to the upper

[illegible] us of late development [illegible]
[illegible] of late development [illegible]

[illegible] in clinical and therapeutic deductions [illegible]
their cases

[illegible]

[illegible]

athalo[illegible]

The [illegible]

Pelu[illegible]

trong per[illegible]

[illegible]

fant [illegible]

gradually [illegible]

Mar[illegible]

Mar[illegible]

[illegible]

[illegible]

J[illegible]

[illegible]

recov[illegible]

To s[illegible] ent[illegible] the his[illegible] three da[illegible] the [illegible] a prev[illegible] is th[illegible] ative cause [illegible] the latent [illegible] infection hel[illegible]

[illegible]

(1) Teta[illegible] ois hu[illegible] had a prev[illegible] two deaths [illegible] tema but [illegible] possibly have o[illegible] on

(2) Profu[illegible] leration [illegible] in temperatu[illegible] prognosis

(3) Perma[illegible] tion of the [illegible] and of the mass[illegible] uthors was very evident [illegible] of generalized [illegible] elopment

(4) The [illegible] a our patient in Case 3 should be [illegible] he was going on well [illegible] appeared thirty three days aft[illegible] the preventive injection and [illegible] have recovered according to the [illegible] clusions of Lerard publi[illegible] the Academy of Medicine May [illegible]

Therapeutic Conclusions

(1) The efficacy of antitetanic serum as a preventive [illegible] established Our results prove that it is more than [illegible] remember this dictum of Lucas Championnière Antitetanic p[illegible] by serum remains a duty for the surgeon and a right of the [illegible]

to be really efficacious the preventive injection must be repeated 14 c c injections of 10 c c at an interval of five to seven days are necessary

(2) These injections in series should be repeated each time that a patient is operated on whether or not he has had tetanus, on account of infections or reinfections of later development

(3) The fear of relapse ought not to restrain the surgeon In testing the sensitiveness of the patient by an injection of 1 c c or by an enema of 10 to 20 c c of antitetanic serum freedom from complication is practically assured In over a thousand injections we have seen no case of anaphylaxis

(4) Injections of antitetanic serum remaining the basis of the treatment large doses must be used 50 to 100 c c daily, and these to be repeated One can go up to 300 to 600 c c Raymond used 150 c c daily and reached with success 2 145 c c Accidents with serum are rare especially if the subcutaneous method be used This method appears the best and in localized tetanus injections may be given in the neighbourhood of the peripheral nerves

For the seriously wounded the intra meningeal method is not convenient on account of the inclined position which it necessitates in order to be efficacious It increases the risk of anaphylaxis the same as the intravenous method as has been demonstrated by Cornet

(5) With the use of serum must be combined sedative medicaments for the nervous system (bromide of potassium, chloral, morphia) tonics for the heart (especially camphorated oil) and also antiseptic medicaments The carbolized solution of Bucelli at 1 or 2 per 100 is well borne in doses of 20 to 40 c c daily and gives good results The tolerance of tetanus patients for drugs is very great and poisoning need not be feared To our great regret we have been unable to try certain new medicaments such as perphoxene, persulphate of soda or sulphate of magnesia

News of the Service.

CASUALTIES.

[illegible] H.M.S. "Vanguard" [illegible] Lieutenant-Commander R.N. Staff Surgeon W. [illegible] Lieutenant-Commander Ratter R.N.

August [illegible] H.M.S. Rectum [illegible] R.N.

August [illegible] H.M.S. Rectum [illegible] R.N.

July [illegible] Surgeon William James McCracken M.C. R.N.

[illegible] gallantry and resource during operations [illegible] wounded [illegible] applied tourniquets, he pushed forward into a village, [illegible] a captured enemy Medical Officer to [illegible] Military Cross [illegible]

[illegible] wounded also entering a small [illegible] and [illegible] he [illegible] wounded.

The K[illegible] greatly [illegible] Staff Surgeon Robert Frank Scott R.N.

[illegible] Lieutenant-Commander R.N. [illegible]

[illegible] Surgeon [illegible] R.N.

[illegible] Surgeon [illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

[illegible] R.N.

The following [illegible] the Birdie[illegible] R.N.

[illegible] CONFERRED BY HIS [illegible] ORDER OF [illegible]

Surgeon [illegible] George Welch [illegible]

DECORATIONS CONFERRED BY [illegible]

[illegible]

[illegible]

Surgeon Commander [illegible] W M [illegible]

[illegible]

[illegible]

[illegible] Surgeon Commander H [illegible] J [illegible] M [illegible]

[illegible] Surgeon Lieutenant Commander [illegible] H [illegible] M [illegible] N

[illegible] HAVING BEEN CONFERRED BY HIS MAJESTY THE KING OF ITALY

Decoration of St Maurice and St Lazarus

(Cross)

[illegible] Surgeon Lieutenant Commander Albert R H Skey M B [illegible] R N

Order of the Crown of Italy

(Officer)

[illegible] Surgeon Edward T P Esmes R N

PROMOTIONS

[illegible] mentioned Officers has been promoted to the rank of Deputy Surgeon [illegible] 1 August 1917 Fleet Surgeon Charles S. Wootwright [illegible]

[illegible] mentioned Officers have been promoted to the rank of Fleet Surgeon [illegible] 10 1917 Thomas B Shaw M B Alfred T Guillaiden M B George [illegible] Francis T Nicholls

[illegible] mentioned Officers have been promoted to the rank of Staff Surgeon [illegible] Surgeon Albert J Gilbertson R N V R dated June 24 1917 Surgeon [illegible] Wilfred R N V R dated July 22 1917

APPOINTMENTS

June.

[illegible] Ward C B to serve as Naval Member of the Medical Con [illegible]

[illegible] Commodore O W Andrews M B to the New Zealand

[illegible] R W B Hall to the Dolphin W H Pope to the Victory addl

[illegible] Lieutenant Commander H F Clark to the Lurcher E Cooper to the Her [illegible] D S O to Portsmouth Dockyard [illegible] D J O'Malley to the [illegible] Commander M B to the London addl F M May to the [illegible] Surgeon Lieutenant M B, to the Pembroke, addl R Hughes to the Victory [illegible] the Victory addl

Staff [illegible] J R A Clark-Hall to the Cumberland J H Wright M B [illegible] addl L Daly M B R A N to R N Barracks Portsmouth [illegible] addl O F Sydney to the Pembroke addl G O M [illegible] Surgeon M B [illegible] addl W N Horsfall M B to the Pembroke addl [illegible]

[illegible] Lieutenant Commander [illegible] Markham to the Caradoc L A Mogeleff M B to R N Air [illegible] C J Guy to the Vivid addl W F Thwaites M B to the [illegible] Medical R M B to the Argyll addl [illegible] Holton to the Royal [illegible] Lieutenant M Mechan to the Northbrook C D Bell M B to the [illegible] Surgeon R N V R A D Cowburn to the Ambrose H L Murray M D [illegible]

Surgeons R.N.V.R. E. Willmot to the Vivid, add. A. F. W. Hall to the Pembroke, add.; W. H. Bleadin to the King George V.; L. C. D. H. [illegible] to the Pembroke, add.; R. H. H. Jolly, M.D., to the Pembroke, add.; W. N. [illegible], M.D., to the Arrogant; D. D. F. Macintyre to the Cyclops, add.; C. S. McMurtrie to the Marmora.

Temporary Surgeons: J. G. Stevens to the Valentine; H. L. Irvine, F.R.C.S., to hospital ship Plassy; L. Heffernan to Hazelbowline Hospital; H. Hill, M.D., F.R.C.S., to hospital ship Gairl Castle; A. P. Parnell to the Marmora; K. H. McMillan to the Circassia; J. E. McCausland, M.B., to the Vivid, add.; R. Biddulph to the Southampton; H. G. Moser to the Vivid, add.; J. H. B. Hogg, to the Vivid, add.; J. E. Jackson to Haslar Hospital; G. F. Gold to the Valiant; J. F. C. Macintosh, M.B., to Haslar Hospital; D. Herrill, M.B., to the Ophir; N. V. Williams to the Australia; A. L. Dykes, M.D., D.P.H., to No. 7 Wing R.N.A.S.; J. F. McCausland, M.B., to R.N. Division Blandford; R. J. Rampling to the Autumn; H. McM. Bowman, M.B., to the Hibernia; J. Grimbly, to the Vivid, add.; R. H. Newton to the Pembroke, add.; W. L. Boyd to the Blake; J. H. B. Hogg to the Ajax; C. G. Terrell, M.B., to the Pilgrim; J. P. Walker to the Pembroke, add.; M. Pearson to the Renown; B. W. Dakers to the Prince; C. D. Brooke, No. 2 Wing R.N.A.S.; T. M. Cunningham to the Isis; C. J. Allan to the Carmania; F. M. Aitkenhead to the Blenheim; W. A. Malin to the Hibernia; H. Seymour, M.D., to the Princess; J. Horne to the Lorraine; S. D. Baker to the Pembroke, add.; W. V. Gabe to the Leviathan; Robert Aitken (A) to the Lusitania; H. C. Brown to the Chaudière; J. W. K. Bruce to R.N. Depôt, Crystal Palace; C. S. Ogilvy to the Victorious; H. B. Bastard to the Zealandia; H. Lewis, M.B., to the Audacious; F. C. Lloyd, F.R.C.S., to Invergordon Naval Depot; A. F. Saundersonn, H.M.A. Hospital Surgeons: D. E. A. Murrowthor, M.D., to the Lion; T. P. Ross to the Cardiff; C. S. Stathers to the Pembroke, add.; W. S. Bailey to the Espiegle; C. H. Brown to the Pembroke, add.; D. G. Churchill to the Rattlesnake; E. L. Elliott, M.B., to Plymouth Hospital; H. Walbaum to hospital ship Karapana; H. O. Blandford to Haslar Hospital; Ali Station: A. C. Shaw, M.B., to the Victory, add.; J. D. Cranage to the Vivid, add.; A. C. Meyer, F.R.C.S., to the Centurion; S. J. Mort, D.P.H., to hospital ship Karapana; G. N. Stathers, M.B., to White City Air Station; O. H. Smith, M.B., M.A., to hospital ship Plassy; A. P. Spark, M.B., to the Minerva; H. I. D. O. Dunwoody, M.B., to the Queen; G. N. Martin to the Collingwood; G. S. Stallman to Cascalog; J. P. Haynes to the Mars; A. S. Dow to the Mars; H. H. Lackey to the Mars; D. Hesse, M.B., to the Mars; P. L. O. Davis, M.B., to the Mars; H. T. Degens, M.B., to hospital ship Rohuna; H. B. Pasback, B.A., D.S.O., to Haslar Hospital; R. S. Carey to Plymouth Hospital; M. O. Harper, M.B., to the Vivid, add.; W. G. Sackey, M.D., to hospital ship Osmo; A. H. West, M.B., D.P.H., to the Victory, add.; H. W. Hasbrouch to the Ajax; P. N. Button to the Victory, add.; C. W. Woodhouse to the Yarmouth; D. B. S. James to Haslar Hospital; T. S. Brillhart to the Cyclops, add.; J. Fernandley to the Cyclops, add.; H. W. Milton to the Lurcher, add.; C. W. Whitlock Bauman to R. M. Camp Tavistock; R. H. Bailey to the Vivid, add.; L. C. M. Woodsthorn, M.B., to Lord Pelham Air Station; T. M. Cunningham to the Isis; W. L. Cripps, M.B., F.R.C.S., to the Centurion, add.; J. L. Dillwing to H.M.A. Hospital Surgeons: M. E. to the Mersey; J. B. Coyle, M.B., to H.M.A. Station Malta; C. H. Browne, D.P.H., to the Wight, add.; J. S. Kennedy to the Vernon; W. L. Clark, M.B., to the Monmouth; J. S. McGrath, M.B., to the Indomitable; J. T. Wilson, M.B., to the Diana; J. D. Rutherford to the Thesus; W. B. Gow, M.B., to the Pembroke, add.; J. A. E. Small, B.A., to the Cygnet; J. P. Wilson to Mallow Air Station; F. E. Cox to the Victory, add.; H. Harvey to the Johnston; A. C. Shaw to Devonport Barracks.

Surgeons Probationers R.N.V.R.: F. H. Smart to the Rosemary; J. F. Dichent to the Hydrangea; W. G. Pannell to the Vindictive; G. S. Duke-Cooper to the Mons; R. C. Hall to the Viking; F. A. Lagan to the Quality; A. I. McKerron to the Undine; W. I. Warner to the Lancelot; F. A. Simpson to the Lucius; A. Small to the Nimrod; R. F. Pratt to the Tartar; F. A. S. Le don to the Intrepid; H. A. A. Pringle to the Tomal; A. Markson to the Nugent; C. I. Wilson to the Intrepid; S. C. Hughes to the Inconstant; A. W. Leakey to the Cattistock; C. N. Warden to the Sirius; T. S. Stalker to the Marguerite; H. Y. Patterson; H. Thurston; H. C. V. Tuthill to the Dragon; S. H. Mathieson to the Vimiera; W. A. Tapp to the Sussex; S. N. Kirkpatrick to the Valkyrie; A. G. Lennox Browne to the Tiger; A. S. C. W. Hart; G. C. Cameron; W. P. Hogarth; W. A. Dobson; and W. J. Crystal to the Hesperus Hospital; H. W. Quinn; W. E. Johnston; K. L. Jones; G. L. Bell; W. H. Mallet; H. I. Thomas; T. I.

[illegible]

[illegible]

[illegible]

Surgeons [illegible]

Deputy Surgeon [illegible]

[illegible]

[illegible]

[illegible] to the Room [illegible]

ADMIRALTY ORDERS ISSUED FROM JUNE 1 TO AUGUST 31, 1917

(Only the more important [illegible] pertaining directly to the [illegible] of Medical Officers afloat and not confidential are [illegible].)

1977.—Poisonous Atmosphere—Apparatus for Entering Compartment Filled with

(N.S. [illegible] 1917.)

Attention should be given to the following points when entry into compartments filled or supposed to be filled with poisonous atmosphere is contemplated.

(a) The [illegible] will not protect against carbon monoxide or [illegible] atmosphere which may be expected in coal bunkers and closed spaces on board ship.

(b) [illegible]

(c) One [illegible]

(d) The [illegible] when working [illegible]

(e) The most [illegible] carbon monoxide gas would be [illegible] the upper deck and [illegible] closed compartment [illegible] board [illegible] has been in use [illegible] kept in the compartment [illegible] should be allowed [illegible] carbon monoxide.

(f) The [illegible] apparatus could [illegible] necessary [illegible]

1979.—Medical Equipment

H[illegible] Air Stat[illegible]

(N.D. 6130 17. [illegible])

Commanding [illegible] of [illegible] are requested [illegible] Other [illegible] Surgeons and Agents [illegible] showing the medical equipment allotted [illegible] Station.

(M.D. [illegible] 17.)

1980.—Syrups or Drugs containing Syrups.

(M. [illegible] 1917.)

Demands for syrups [illegible] containing syrup [illegible] present. Outstanding [illegible] for syrup [illegible]

2311.—R.N.A.S. Officers proceeding on Foreign Service—Medical Examination.

(C.W. 29353/17.—6.7.1917.)

Whenever pilots and observers [illegible] foreign service [illegible] the Medical Officer of the station [illegible] that they are in all respects fit [illegible] and that they are not suffering from any disease which renders them unfit for [illegible] a certificate to that effect to the Commanding Officer [illegible] the Officers proceed abroad.

2120.—Invaliding—Report (Form D. 145).

(M.D. 6974/17.—1.6.1917.)

[illegible] Marines [illegible] will be obtained from the supplies [illegible] West India Dock.

2269.—Clinical Thermometers—Supply.

(M.D. 6871/17.—[illegible].1917.)

[illegible] Medical [illegible] should [illegible]

2066.—Dentures—Supply to Dockyard Employees.

(M.D. 7833/17.—[illegible].1917.)

[illegible] dockyard employees [illegible] injured on duty [illegible] M.D. 5601/17.

[illegible] Surgeon [illegible] Medical [illegible] dentures [illegible] supplied [illegible]

(M.D. 5601/17.)

2071.—X Ray Tubes.

(M.D. 9470/17.—10.8.1917.)

[illegible] X ray tubes will be [illegible] and are very liable to be [illegible] through them [illegible] small current [illegible] through the [illegible] the proper point. The gas [illegible] the tube [illegible] Therefore [illegible] be arranged to carry a small current through the regulator [illegible] The [illegible] the tube [illegible] for the time being.

2381.—R.N. Auxiliary Hospital, Hull—Telegraphic Address.

(M. 17681/17.—10.8.1917.)

[illegible] Hull [illegible] has been registered as the telegraphic address of the Royal Naval [illegible] Hospital, Hull.

2338.—Invalids' Descriptive Return.

(M. 1117.—22.8.1917.)

[illegible] to M.O. 7060/17 [illegible] that a descriptive return should [illegible] injuries and [illegible] invalided from the Service [illegible] R.N. Barracks [illegible] West [illegible] should therefore [illegible] except [illegible]

[illegible] the hospital [illegible]

(3) The [illegible]
[illegible]
(M [illegible])

2425.—Visual Malingering—Apparatus for Detection

(M B [illegible] 1917.)

An apparatus designed by the [illegible] at the Royal Naval Hospitals at Haslar, Plymouth and Chatham (Model [illegible]) [illegible] satisfied that simulation is [illegible] may be sent for examination.

2509.—Surgeon Probationers

De troyers

(C W [illegible] 1917.)

In order to provide better facilities for the instruction [illegible] Surgeon Probationers [illegible] Destroyers [illegible] that when Destroyers [illegible] Surgeon Probationers are to live in such ships as may be [illegible] [illegible] only when the [illegible] are proceeding [illegible]

(2) When [illegible] Ships there are [illegible] in the Rules laid down in M.O. 490/16 in Office [illegible] [illegible] on the General Medical [illegible] they are to apply [illegible]

2510.—First Aid Appliances—Cupboards.

Steamers and Convoy Sloops

(D [illegible] 1917.)

A small cupboard containing an outfit of First Aid Appliances [illegible] following, now fitted in all steamers and convoy sloops, viz.:

(1) On [illegible] deck in charge of the Commander [illegible]

(2) On [illegible] deck in charge of the Officer [illegible]

(3) On both decks amidships.

(4) The cupboards are to be kept locked, one [illegible] assigned [illegible] necessary articles.

(3) The outfit should consist of the following, made up from [illegible] board. Each cupboard to contain:

Bandages, roller, 1 inch	[illegible] of [illegible]
" flannelette 4 inch	[illegible]
" triangular	[illegible]
Cotton wool, 1 lb. packet	[illegible] packets
1st field dressing	[illegible]
Iodine, ½ lb. packets	[illegible]
Pneumo dressing	[illegible]
Tins, safety	[illegible]
Tourniquets	[illegible]
Solution potassium permanganate	[illegible]

2740.—Silicol Plant working—Respirators to be worn

Irishay Stations

(A [illegible] 1918.)

All men employed in making [illegible] are to [illegible] respirators over their nose and mouth while they are exposed to silicol dust.

Arrangements are being made for a supply of [illegible] respirators to be available at Crystal Palace when required [illegible] in accordance with the requirements specified by the Staff Medical Officer.

The following rules are to be [illegible] daily [illegible] to be taken [illegible] more than [illegible] required [illegible] in the [illegible] of the Medical Officer and be sent by [illegible]

No man whose health [illegible] should be allowed to work with silicol [illegible] kept [illegible]

(M [illegible] 1917.)
(R N V S [illegible] Monte St [illegible])

2820.—Naval Medical Transport Organization

(M.O. 7647/17.—5.7.1917.)

The Principal Medical Transport Officer is established in Medical Department, Admiralty, S.W. 1.

Telegrams.—Medtrans—Westrand—London.
Telephone.—Admiralty 115.

(2) Medical Transport Officers are established at—

Chatham.—Medical Transport Office, R.N. Barracks.
Telegrams.—Medtrans—Chatham.
Telephone.—Dockyard 138 and 238.

Plymouth.—Medical Transport Office, R.N. Hospital.
Telegrams.—Medtrans—Plymouth.
Telephone.—Devonport 385. Extension 44.

Portsmouth.—Medical Transport Office, Navigation School, Dockyard.
Telegrams.—Medtrans—Portsmouth.
Telephone.—Portsmouth 638 or Dockyard—Navigation School.

Hull.—Medical Transport Office, 8, Sunny Bank, Hull.
Telegrams.—Medtrans—Hull.
Telephone.—Central 603.

Edinburgh.—Medical Transport Office, 16, Royal Circus, Edinburgh.
Telegrams.—Medtrans—Edinburgh.
Telephone.—Central 3256.

[illegible] Medical Transport Officers—

Hull.—[illegible] S.N.D., Thomas N. B.
Aberdeen.—46, Marischal Street, Aberdeen.
[illegible] H.M.S. Saxelbie.
[illegible].—North Shields.
Liverpool.—23, Russell Street, Liverpool.
[illegible].—17, Whiteladies Road, Clifton, Bristol.
[illegible].—Maisons de la Reine, Dieppe.

(4) Medical Transport Officers (M.T.O.s) will arrange for the meeting of patients [illegible] station and then transport to hospital in each place with the following exceptions:

(5) [illegible] requiring immediate hospital should be notified to the [illegible] will then arrange for their transport to hospital.

(6) Where [illegible] Port of Division Hospital by tram and not by the [illegible] the local M.T.O. should be advised by telegram of the time of [illegible] of their port, to the nature of the case, and whether the patient [illegible].

(7) Before [illegible] forward he should be furnished with an Itinerary Order in the form shown [illegible]. When changes of railway company or transport are in question the compartment, [illegible] intend on the form from the beginning to the end of the journey.

ITINERARY FORM FOR PATIENT PROCEEDING TO HOSPITAL BY ORDINARY TRAIN.

Place of commencement of journey

Date 1917

Name

Rank or Rating

Ship

You are hereby ordered to proceed to the R.N. Hospital at [illegible] for the treatment of [illegible].

You are to travel by the following route:

Leaving	[illegible]	[illegible]
Arriving	[illegible]	[illegible]
Leaving	[illegible]	[illegible]
Arriving	[illegible]	[illegible]
Leaving	[illegible]	[illegible]
Arriving	[illegible]	[illegible]

This order is to be given up on [illegible] Railway of the Ambulance on completion of railway journey.

Surgeon and Agent or Officer forwarding.

(M.O. 2010/17 [illegible] cancelled.)

OBITUARY

[illegible] GEORGE [illegible] Cox was killed in the explosion of the [illegible] July 1. Educated at Gresham College, Cambridge, [illegible] graduated B A in 1911 and M B B C in 1900. He had [illegible] Assistant [illegible] Medical Officer at the Department of the [illegible] the Navy on February 11 1901 obtaining his first [illegible] In June 1901 he was awarded the Martin Scholarship [illegible] at the passing out exam and was at the end of all his [illegible] Mars and Hawke in Home waters he was appointed [illegible] Mediterranean Station in 1903. Coming home in [illegible] China in the Dublin where he served two years. [illegible] on the Staff of Chatham Hospital. He was promoted Staff Surg. on in 1909 and [illegible] to sea again first in the [illegible] and then to China [illegible] and then to Malaya. His next Home appointments were [illegible] Hogue (temporary) Aeradne and the Africa. During the [illegible] he served abroad [illegible] Hilary for nearly two years and was appointed to the Vanguard in July 1 [illegible] Full of energy and a keen worker he earned a very high reputation among his [illegible] outstanding officer. He was fond of games and [illegible] a thoroughly good sportsman. [illegible] December 1908 he acted as honorary to the Naval Section at the Meeting [illegible] British Medical Association at Belfast.

STAFF SURGEON WILLIAM GEORGE BARRAS R N V R was killed in the explosion on board the Vanguard on July 2. He was educated at Glasgow University. He graduated M B C M Glasgow in 1889 taking the L S S A Durham in 1890 [illegible] M D Glasgow in 1894 and the D P H Glasgow in 1903. He held the appointments of Physician to the Eldar Cottage Hospital Cardiganshire and Medical Referee to the Friendly and other Insurance Companies and Assistant Medical Officer of Health and Bacteriologist in the Burgh of Dundee. He was also a member of the Society of Medical Officers of Health and the Pasteur Institute of Lille and the Medical Society. He was the author of many interesting professional publications among which are "Statistical Inquiry into the Causes of Death within the Burgh of Cupar from 1884 98" "Notes on Cases of a Pulmonary Infection accompanying Enteric Fever" (*Glasgow Medical Journal* 1899) "Outbreak of Tetanus Infantum with Infected Ice cream" (*Lancet* 1904) "Managed Infection by *Diplococcus pneumoniae*" [illegible] He joined the Royal Naval Volunteer Reserve in 1911 and served in Naval Hospitals on two occasions. 1911 to 1912 for a course of instruction in naval medicine and then. In 1905 he was appointed to the Arrogant and in 1906 the Dunoon when that ship went to Cape Town. He was promoted to Staff Surgeon in 1912 and in July 1914 went to sea in the "Lord Nelson" for the mobilization test. He was then in service afloat when was broken out. He joined the Vanguard in March 1915.

SURGEON EDWARD KAYNER R N V R who was killed in the explosion in which destroyed the Vanguard was the elder son of the late Mr Edwin Thynor of Fitzchial Wadhurst, Sussex and Mrs Rayner Queen's Hotel Upper Norwood. He was born in Hampstead in 1886 and educated at Haddon Court and the South Eastern College at both of which he was conspicuous in sports. He gained a rowing blue and was a first class player. He entered Pembroke College Cambridge and took a first in the Natural Sciences Tripos in 1908. Training his attention to medicine he studied at Cambridge and St Thomas's Hospital. He was a keen rugby player and passed the compulsory colleges examination in 1914, and receiving his degrees of M B B C Cantab. the same year. He acted as House Surgeon and Casualty Officer at St Thomas's while working for his F R C S. This according to a friend he passed with marvellous ease. When the War broke out he was House Surgeon to the Isolation Block at this hospital and at once applied for a commission as Temporary Surgeon R N. He served in Calliope until the Royal Naval Division. Impressive and with and courteous manner of bearing. He was one of those who saw it campaigning through from start to finish and has every [illegible] a skill lower number who never lost faith and who never lost his sunny smile. He even when suffering from epidemic jaundice he never allowed his [illegible] to be pessimistic and shock from what this suffering from the same disease [illegible] allied home. After the evacuation he became seriously ill and came to England. Last autumn after his recovery he was applied for Surgeon to the Vanguard and was delighted with the Flag. Flag and never complained

[illegible]

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